

## MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—THE QUESTION OF VISUAL PERCEPTION IN  
GERMANY. (I.)

IMPARTIAL readers of recent English discussions of the space-question will be ready to admit that there is still ample room for more than one theory of the subject. Some years ago it was commonly thought that, thanks to the arguments of the Berkeleyans aided by the experiments of Wheatstone and others the derivative nature of visual space was amply demonstrated. Yet the skilful rehabilitation of the opposite doctrine by Bailey proved, as J. S. Mill allowed, how great the difficulties are which still beset the problem. More recently the ingenious arguments of what may perhaps be called the Dublin school, including Messrs. Abbot, Monck, and Mahaffy, have shown that the theory of visual space is even now far from being finally determined.

In Germany the same unsettled condition of the problem meets us. Indeed the division of opinion is even more strongly marked in that country than in our own. English writers on the whole have followed the direction indicated by Berkeley, who may be said indeed to have given shape to the problem in our country. In Germany, on the other hand, the discussion of the question received its initial impulse from the opposite side, namely, from the peculiar intuitional doctrine of Kant. And this fact explains why the intuitive or original view has been so ably represented in German writings. On the other hand, how-

ever, the influence of Berkeley and generally of the analytic English psychology has made itself felt in the German discussions, and at present it may be said that the derivative view of space is quite abreast, if indeed not in advance of, its rival.

The field in which the space-question has been most warmly discussed is that of visual perception. This domain is clearly not one of pure psychology (in its narrow sense as a subjective science), but to some extent comes under the control of physiology. It offers ample territory for exact objective observation, and for skilfully arranged experiment. Accordingly one finds that in Germany it is the physiologists who have done most to advance the question of the nature and origin of visual space.

The immense advantage that the co-operation of these workers has secured is the accumulation of a large mass of new material which the psychologists of the future will have to work up in their theoretic constructions. Of the nature and extent of this material it is my chief object to give some account in this paper. It consists of observations and experiments which, being carried out by men trained in the conditions of accurate scientific data, is worth unspeakably more than the rough personal observations which used to be put forward as a sufficient groundwork of a psychological theory of space.

It will naturally be expected that such workers, having to deal with so complicated a set of phenomena, and not being specially trained in psychological interpretation, would, as soon as they began to theorise on their facts, reach very different results. What most strikes one, perhaps, in going over the recent literature of the subject is the number of seemingly distinct hypotheses set up in explanation of the phenomena. Closer inspection, however, shows that the diversities are often little more than verbal. Further, a free exchange of criticisms has served both to diminish the points of difference, and to reduce the number of the competitors whose claims are worth serious consideration.

I propose in the present paper to give a very brief sketch of some of the principal results of recent researches in physiological optics which bear on the nature of the visual perception of space. So far as possible I shall confine myself to facts, only giving such immediate conclusions from these as seem to be indisputable. In a second paper I hope to indicate the various ways in which the representatives of the different theories seek ultimately to interpret the facts.\*

First of all, then, let us inquire what has been done of late to

\* I am indebted for most of these facts to Helmholtz's classical work *Physiologische Optik*. Next to this Wundt's elaborate treatise *Physiologische Psychologie* has proved most useful.



elucidate the nature of the eye's perception of space-relations in two dimensions, namely, relative direction, magnitude, and figure. We will first of all consider these properties as perceived by the single eye. The appreciation of them in binocular vision is a subject so intricate as to call for a special discussion later on.

If we ask what are the means at the disposal of the eye in its construction of space, we find that these consist of two and only two modes of sensibility. The first of these is what is known as the discriminative local sensibility of the several nervous elements which compose the sensitive layer of the retina. It must be admitted that in the mature eye a peculiar local interpretation belongs to all impressions falling on the same retinal elements.\* What the ultimate nature and the origin of this sensibility may be, is a question which must for the present be postponed. The second mode of sensibility which, as is now generally admitted, is involved in these perceptions is that which is variously known under the name of the muscular sense, feeling of innervation, and so on. There are a number of feelings attending ocular movement and the action of the ocular muscles. Of these the chief are those which accompany the actual movements of the eye, and which vary according to the direction and range of these movements. The question of the precise nature of this motor and muscular sensibility will have to be dealt with under the head of theoretic interpretations.

By help of these two orders of feeling, the eye gives local order to its impressions in respect of the relative position of points, lines, &c., their distance from one another, their magnitude, &c. In other words, by these means it is capable of conceiving the position of points, &c., in two dimensions.

Had we no other knowledge than this we should assign no particular distance to objects, nor would the surface on which we projected them have any particular shape. With our mature ideas of space, we cannot, it is clear, conceive what our space-intuition would be under these circumstances, though we may gain a faint imagination of it, perhaps, by thinking of the space-ideas of microscopic creatures living on the surface of a sphere, and knowing only points, lines, &c., lying on this surface.

It is sometimes said that from the first we tend to project retinal impressions on to an imaginary concave surface. Thus it is said that from the first children conceive the sky as the inner side of a hollow sphere. Yet it must not be supposed that our perceptions of the relative position and distance of points (or lines) would involve any such conception. The notion of a

\* Strictly speaking, this varies with the position of the eye. I assume here that the eye remains in one and the same position.

hollow sphere belongs to our complex mature space-consciousness, and our interpretation of the sky as a cupola may be explained as the resultant of many experiences.

In investigating what has been done to clear up the conditions of this side of our space-perception, we naturally begin with the discriminative sensibility of the retina. Careful observations have been made in this region by E. H. Weber and others, corresponding to the celebrated researches conducted also by Weber in the domain of tactual sensation. It appears from these that, in the case of a practised eye, in the area of perfect vision (the yellow spot) two points are distinguished when the visual angle reaches 60-90 seconds, or when the retinal image has a magnitude of 0.004-0.006 millimetres.

The discriminative sensibility is less fine as we pass from the centre to the peripheral regions of the retina; and, what is more curious, this falling-off takes place more rapidly along certain retinal meridians than along others. Thus it is less rapid in the horizontal than in the vertical direction. (Aubert & Förster.)

It seems probable that the cones, which are much more numerous in the area of the yellow spot than elsewhere, are the ultimate sensitive elements of the retina. It is a question, then, what relation exists between the minimum of local discrimination and the magnitude of the cones. This point is not yet settled, owing to the conflicting results of the measurement of these elements by different observers.\*

The decrease in discriminative sensibility towards the periphery is explained by the comparative sparsity of the cones. It seems probable that over and above this circumstance, inequalities in the exercise of the different retinal regions have an influence here. It is to be supposed that just as special practice is found very considerably to increase the power of discrimination in the yellow spot, so the customary exercise of the eye would tend to render the sensibility of the central still more delicate than that of the peripheral regions.

The results of the defective observations reached on this whole subject point to the conclusion adopted by Wundt, that the local discrimination of the retina is somehow limited by the size of the ultimate nervous elements, though additional attention and practice may effect a considerable increase of sensibility within these limits.

\* Helmholtz, leaning on measurements of Kölliker, argues that the minimum retinal interval of distinguished points must be greater than the diameter of a cone. Wundt, following the measurements of H. Müller and Max Schultze, thinks that impressions may be distinguished which fall within the area of a single cone, and that this is effected by the help of the distinct fibrils which issue from one and the same cone.

We may now pass to the second elementary factor in the visual construction of space, namely, ocular movement.

The eye is rolled about its centre by means of six muscles. So far as a mere inspection of this mechanism would tell us, we might suppose that the eye's axis could be moved from any given point in the field to any second point by different combinations of muscular contractions. In point of fact, however, it is found that these movements are invariably carried out in one particular way. Thus it was found by Donders that to a given position of the eye's axis relatively to the head, there belongs a certain and invariable amount of rotation about this axis. In other words, whenever the eye fixates a particular point in the field (no matter from what other point it has moved), the various regions of the retina preserve the same relative arrangement.

Once more, it has been found by Listing that when the eye sets out from a certain 'primary position,' in which the principal axis is directed to the point of the field immediately in front of the eye, there is no rolling about the axis at all. In all such cases the movements are the same as if the eyeball rotated about an axis lying in the vertical plane which we may imagine to divide its anterior and posterior hemispheres.

There are two ways of regarding these uniformities of ocular movement. According to Wundt they answer to the least expenditure of muscular energy, and are conditioned by certain innate arrangements of the muscular mechanism.

On the other hand Helmholtz argues that these laws are to some extent the result of the individual experience. He has succeeded by the use of prisms, which impose unwonted conditions on binocular vision, in producing abnormal combinations of axial movement and rotation about the axis.

These views may be reconciled by the supposition, put forward by Wundt, that there is an innate disposition to the habitual or normal combinations, though this is itself the result of the collective experience of the race.

Some of the more obvious results of these laws in relation to visual perception are the following. First of all it follows from Donders's law that, whenever the eye returns to a particular point of the field, a fixed object in this region will be pictured on the same retinal elements. Now it is certain that the experienced eye perceives form when at rest and by help of the varying local sensibility of the retinal elements. It must follow, then, that so far as the eye appreciates form through a number of simultaneous retinal impressions, it will have an advantage in rotating as this law defines, since it will be able to return an indefinite number of times to an object at rest, and to receive from it a

perfectly similar group of retinal impressions on the same nervous elements.

The implications of Listing's law are still more important in relation to our present subject. It follows from this law that when the moving eye traces a line immediately in front of it, it necessarily receives the image of the line on the same series of retinal elements or the same retinal meridian.\* That is to say, the nervous elements excited by any two successive impressions of the lines will for the greater part be the same, only a few of the old elements being dropped and new ones taken up. Consequently any deviation from a perfectly rectilinear direction in the line would (so far as this is appreciated through retinal sensibility) at once make itself felt through this intrusion of a new nervous element falling outside the meridian. It follows then, that, so far as the eye appreciates form through retinal sensibility alone, it will be much better able to estimate the straightness of a line which lies immediately in front of it than of those situated elsewhere.

Observation bears out this conclusion. When we want to tell very nicely whether a line is straight, we half instinctively bring it exactly in front of the eye so that its centre coincides with the principal point of fixation, and then let the eye wander up and down it. In this case the appreciation of rectilinear form is very delicate.†

Another consequence of Listing's law is that when the eye (the head being supposed to be fixed) moves from the primary position over the field in different directions, certain fixed lines in the field will necessarily be pictured on the same retinal meridian.‡ This applies to all parallel lines lying in the central portions of the field. It would seem to follow that so far as retinal sensibility is involved there will be an advantage in appreciating the direction of parallel rather than of any other lines in these regions. Further, one may deduce from this law

\* Strictly speaking this holds true of all lines, straight or curved, which cover or could be projected on any one of the great circles of the concave field which intersect at 'the principal point of fixation' immediately in front of the eye.

† This is true even when the eye is at rest. This would be explained by the supposition that the elements of one and the same meridian (in the central regions of the retina) have their discriminative sensibility sharpened by the exercise involved in these habitual and critical movements. Of this more hereafter.

‡ This is true of all lines whose projections on the concave field correspond to circles which intersect at 'the occipital point'—an imaginary point supposed to be situated behind the head, and answering to the principal point of fixation—and which at this point of intersection touch one and the same meridian of the field.

that it will be much easier to measure the length of two parallel lines than of two diverging lines, since in the former case the successive images may be made to fall on exactly the same series of retinal elements.

These conclusions, again, are fully corroborated by observation. The eye is able to detect very slight deviations from a parallel direction in pairs of lines when these lie opposite the eye in the central regions of the field. Again, it detects inequalities between lines much more easily when they are parallel than when they have different directions. Once more, the magnitudes of angles with parallel pairs of lines are compared much more exactly than those of angles contained by non-parallel pairs of lines.

One further consequence deserves to be mentioned. We are able to appreciate form to some extent in indirect vision. It might be conjectured from what has gone before that the relations of points and lines implied in the forms of objects thus viewed will be better appreciated when they are so situated that their images may successively be received on the same retinal elements. This seems to be so far borne out that with the eye at rest we can pretty accurately appreciate the inequality of two parallel lines in the central field, though the comparative measurement of two lines having unlike directions is liable to be far from exact.

The most striking fact, however, in this indirect visual appreciation illustrative of the law of movement now discussed is the following. When the eye moves from its primary position to a point far out in the peripheral region of the field a really vertical or horizontal line is no longer imaged on the same retinal meridian as lines of the same direction in the central regions. How then, it may be asked, does the eye at rest regard such lines in these outlying portions of the field? Curiously enough, under these circumstances it estimates form in relation to the impression which would be made on the central area of the retina if the eye were moved to the object. Thus a line actually vertical appears in indirect vision inclined and *vice versa*. As soon as the eye fixates the line the illusion disappears. This fact is of great interest as pointing to the secondary or derivative character of the eye's indirect appreciation of form.

I have hitherto assumed with Helmholtz that in these appreciations of form and magnitude the discriminative sensibility of the sensory elements of the retina takes part. At the same time it is to be observed that in all cases of successive comparison in direct vision the sensibility connected with the eye's movements may be the ground of judgment as well. Thus, in comparing the length of two parallel lines it may be

said that the perception rests on the motor or muscular feelings which accompany the eye's movements along each of the lines. In truth there are facts which seem to prove that this is actually so. E. Hering has in a recent work, *Die Lehre vom Binocularen Sehen*, attempted to show that within certain limits in the centre of the field a movement along a line is carried out from first to last by the same muscles; further that under these circumstances the muscles employed work in the same ratio of intensity from the beginning to the end; and finally that owing to the particular arrangements of the muscular apparatus all parallel movements within these limits are effected by the same muscles pulling in the same ratio of force. These facts, if fully established, are of the first consequence for the understanding of the eye's appreciation of form. They would serve to explain its peculiar delicacy in the estimation of straight lines, and in the comparison of the directions of parallel lines (and so of the magnitude of angles contained by parallel pairs of lines), solely on the ground of muscular sensibility.

There seems, then, to be two equally good ways of explaining these facts. Since movement accompanies nearly all our perceptions of the direction and magnitude of lines, we may suppose that muscular sensibility commonly takes part in these judgments. At the same time it is certain that some of these judgments are carried out by means of simultaneous impressions, the eye being at rest and fixating the centre of the line. Thus the differential sensibility of the nervous elements is a fact which must be accepted and accounted for.

Yet though this sensibility must be supposed to enter into our judgments of relative position and magnitude, it by no means follows that it is superior in delicacy to the motor feelings. Wundt argues on the contrary that the finest discriminations of magnitude are only possible by help of ocular movement. According to the experiments of Volkmann and Fechner, the eye's discriminative appreciation of linear magnitude follows within certain limits the latter's psychophysical law. That is to say, the minimum difference perceived is a pretty constant fraction of the length of line compared.\* Below a particular limit, however, this relation no longer holds good. Wundt argues very ingeniously that this 'threshold' is imposed not by the area of the retinal elements, but by the limits of discriminative motor sensibility.

Wundt considers that the influence of the motor feelings (which he calls 'feelings of innervation') on the visual appre-

\* This fact does not tell, so far as I can see, in favour of either sensibility, since Fechner's law is known to apply both to the intensive and the extensive magnitude of sensations.

ciation of form and magnitude is illustrated in many of the well-known optical illusions respecting relative direction and size. These he seeks systematically to refer to peculiarities in the process of innervation involved, and its attendant feeling. Thus it is known that we over-estimate vertical magnitude relatively to horizontal. This arises, says Wundt, from the fact that horizontal movements are executed by a single pair of muscles (rectus externus and internus), whereas vertical movements involve two pairs (rectus superior and inferior and the two obliqui) which oppose one another in a certain measure.\* Hence a greater muscular strain, and so a greater feeling of innervation, in the latter than in the former instance. Similarly the error made in over-estimating magnitude in the upper as contrasted with the lower regions of the field, and in the outer as compared with the inner regions, is referred to differences in the degrees of innervation involved.†

While Wundt thus emphasises the influence of the feelings of movement in monocular appreciation, Helmholtz calls attention to the effects of past experience. Thus he would explain our disposition to over-rate the magnitude of the vertical direction relatively to that of the horizontal by the fact that by far the largest number of forms compared in daily life coincide with the plane of the ground,‡ and consequently have their upper portion further from the eye than their under, so that the vertical is foreshortened. Owing to this prevailing experience we acquire the habit of interpreting the vertical dimension as larger than it directly appears.§

The co-operation of ideation or of imagination based on experience, is illustrated still more distinctly in the filling-in of the lacuna in the visual field answering to the blind spot in the retina. Volkmann has called attention to the fact that when the lacuna falls on the printed page of a book, we fancy at first that we see letters within the limits of the lacuna.

\* Wundt holds that rolling about the axis is prevented by an antagonistic action of the combining muscles (*e.g.* the superior rectus and obliquus).

† He thinks that since in transverse section the upper muscle exceeds the under in calibre, and the inner the outer, a smaller degree of innervation is required. Wundt's attempt to reduce all the well-known cases of illusory measurements (including Zöllner's pattern) to special moments in the feeling of innervation is ingenious though somewhat forced. On the other hand, Helmholtz's explanations hardly seem more satisfactory.

‡ The reason for this prevailing mode of viewing forms is to be found later on.

§ Another fact differently interpreted by these two observers is that a line drawn precisely vertical to a given horizontal line appears to be slightly inclined. The meaning of this will be best discussed later.



The illusion disappears with a concentrated effort of attention. The phenomena of the blind spot show incontestably that our visual perception of space-relations is to some extent a process of inference or of imaginative construction out of remembered elements of previous experiences. We fill the gap in the field with ideal impressions, which the eye would receive were it to fixate this particular region.

Let us now pass to another aspect of our visual intuition of space. So far I have spoken of relative direction only, or the position of points in relation to one another. It is a different question what determines the eye's judgment of the absolute direction of objects in the field, *i.e.*, their position relatively to one fixed starting point. This standard of direction is clearly our own position in space. When we refer an object to the left or right of the whole field over which our moving eye wanders, we assign it a position relatively to that of our own body.

This absolute direction is known in monocular vision when the position of the axis of vision (principal axis) is known. The several parts of the total field over which the eye travels (the head being supposed to be fixed) are all projected in different directions. As soon as we know the absolute direction of any one of these successive lesser fields we are able to fix the direction of any particular object in this region in relation to this fixed direction as centre. Accordingly what we have to find is the eye's means of determining the absolute direction of any given partial field, in other words, any given centre of fixation.

Our perception of direction depends, as abundant observation shows, in part on the motor feelings of the eye. In every movement of the organ upwards or downwards, to the right or to the left, and so on, some peculiar shade of motor feeling arises. Moreover each of these modes of feeling varies with the range of the movement executed. The different feelings attending these varieties of movement are the ground of our projecting impressions in this or that direction.

That the motor feelings do thus serve as the ground of judgment is proved, as Helmholtz says, by the simple experiment of closing one eye and pressing the other inwards with the finger. The result of this is that objects appear to move inwards too. The explanation of the phenomenon is that since in this case there is a transference of the retinal picture to new elements without any consciously executed ocular rotation, we ignore the passive movement of the eye-ball and infer that objects have shifted their position in the opposite direction to that of the retinal image.

In this connection the effects of a paralysis of the ocular muscles are highly instructive. If the external rectus of the right eye (or its nerve) is completely paralysed, every effort to move the eye outwards (which is of course futile) is attended with an impression that objects are moving to the right. Here the feeling of motor innervation misleads the patient who, supposing that his eye has actually moved outwards, infers that since there has been no shifting of the retinal picture objects have followed the eye. If the paralysis is partial, there is still an error in the perception of direction which shows itself as soon as the patient attempts to seize an object.

Closely related to this point are some of the phenomena of giddiness. The apparent movement of objects in this condition is in certain cases explained by help of the motor feelings. When we have for some time followed objects moving in one direction, as when sitting in a railway carriage we follow the apparent backward movement of the objects near the railway, our eye continues for some time to move in the same direction though we are quite unconscious of the movement.\* If now we try to fixate some object at rest, our eye in reality passes across it, and the result of the unconscious ocular movement is interpreted as a movement of the object in the opposite direction, namely that of the train's motion. In other words, in this case as in that of pressing the eye-ball, what is ignored in ocular movement has to be interpreted as a movement of objects in the opposite direction.

But how, it may be asked, do we perceive direction when the eye is at rest? To explain this, we must have recourse to another side of muscular sensation. Not only does actual movement yield a certain consciousness which is known as the feeling of movement: any muscular tension when not leading to movement affords a particular mode of feeling also. Thus

\* That the eye does thus actually continue to move after we cease to be conscious of the movement, may, says Wundt, be directly perceived by an 'objective observer'. Why do we cease to be conscious of the movements of the eye in these cases? Helmholtz argues that after following objects moving in the same direction for some time, we come to look on the required motor innervation as that proper to a fixation of the eye. In other words, the muscular feelings by which we estimate a state of fixation of the eyes become obscured. Wundt holds that this is no adequate explanation. He considers that not only the actual movements of the eye but also the extraordinary efforts to counteract these movements and to fixate the moving object (which efforts are continually thwarted by the invincible tendency to follow the object) affect our judgment here. By over-estimating these futile impulses we both under-estimate the velocity of the moving objects, and afterwards overlook the slight amount of movement due to the momentum so to speak which the eye has acquired.

whatever the position of the eye relatively to the head, there belongs to this position a particular state of muscular contraction, and, as the concomitant of this, a particular shade of consciousness. To quote Hering: "The innervation and the muscular action corresponding to this is a one-valued function of the situation of the point of fixation in the field". We may naturally suppose that the primary position being that in which the muscular tensions are equalised, and so the natural and normal position, serves as the customary standard of direction. The feeling attending this condition of the muscles serves as a basis of our judgment of the leading direction, namely the front. Any other position of the eye-ball will be estimated as a deviation from this normal position.

So far we have supposed the head to be fixed. When the head moves the sense of direction is of course more complicated, the feelings which accompany the contraction of the muscles of the neck being now a factor in the judgment.\*

Finally it is to be observed that according to recent researches the apparent direction of objects may be affected by those feelings which yield us the general consciousness of our bodily position or attitude. Thus the apparent movement of objects after rapid rotation of the body (as in dancing) is now attributed not to unconscious and misleading movements of the eyes relatively to the body, but to a perverted sense of how the body stands.†

The position of the head and of the eye-ball being thus known through motor feelings, our judgment respecting direction is determined by the special local sensibility of the several retinal fibres. Impressions falling on particular elements are projected in the direction of the optic axis (*i.e.*, the axis of the bundles of rays which converge on the different retinal elements). That this projection in the case of the experienced eye is immediate

\* The appreciation of the position of the head is found to be more exact in the light than in the dark. According to an experiment of Aubert, we under-estimate the amount of rotation of the head in the dark. This shows that the feelings yielded by the muscles of the neck are vague and insufficient, and that under ordinary circumstances we estimate the position of the head in part by differences of optical impressions, namely, the shifting of the image of the visible parts of our own body.

† Helmholtz thinks we deceive ourselves in these cases as to the exact moment in which the body ceases to rotate. The researches of Goltz and Crum Brown render it probable that this confused sense of the bodily posture after rotation is due to disturbances in the normal pressure of the fluid contents of the ampullæ of the ears, the feelings attending which play a prominent part in the maintenance of the equilibrium of the head and with it that of the body.—See Ferrier's *Functions of the Brain*, p. 60.

and unavoidable is seen in the fact that we continue to project subjective after-images (spectra), and the sensations of light caused by pressing on the hinder parts of the eye-ball, in the direction of the axis even when we are fully aware that no objects answering to these perceptions exist in these quarters.

If the direction of the rays impinging on the retina is artificially altered the result is an apparent shifting of the visual object. This may be illustrated by covering the eye with a glass prism in such a way that the edge or angle of refraction shall be vertical and to the left. Under these circumstances the objects of the field appear to be shifted to the left.

It might be supposed that the single eye's perception of direction depends exclusively on the two conditions just spoken of, namely, the feelings of motor innervation and the special local sensibility of the different nervous elements of the retina. But recent experiment has shown that yet another factor contributes to this judgment. Hering has made the following observation:—The two eyes first fixate an object infinitely distant, so that the principal axes have a parallel direction. If the right eye be then closed and the left eye preserve its direction, the object appears exactly as before. If, however, the left eye be now accommodated to a nearer point in the same line of sight the object appears to shift to the left. The retinal image has in this case undergone no change of place, and the only new element introduced by the accommodation is the movement of convergence in the closed eye. It follows from this that when we judge of direction by one eye the position of the closed eye helps to determine the judgment. To quote Hering—"The direction of vision is the same for the left eye, the right eye, and the two eyes" (*Beiträge*, p. 28).

Helmholtz has found that a precisely similar relation between the open and the closed eye exists with respect to rolling about the axes. When the two eyes, after having a parallel direction, are made as before to converge towards a point in the line of sight of the open eye, a line which before appears horizontal seems to undergo a rotatory movement about its centre. The various meridians of the retina of the open eye do not in this case undergo any rotation, and the change in the apparent direction of the line is due to the rolling of the closed eye. These facts are gathered up by Hering and Helmholtz under the figure of an imaginary cyclopean eye placed midway between the two eyes and fixating the common point of fixation of the two eyes. If we suppose the retinal images to be transported from one of the actual eyes to such an eye so that central point (fixation-point) falls on central point, and retinal horizontal meridian on horizontal meridian, then "the points of the retinal image are

projected outwards in the line of direction of this imaginary cyclopean eye".

Helmholtz connects these curious facts with the circumstance that our normal customary vision is binocular, not monocular, and that we learn from experience to estimate direction not in relation to the single eye but in relation to the median plane of our body which supports the organs of movement. That the monocular perception of direction has for its fixed starting-point the median plane of the head, coinciding with that of the nose, may be proved by means of the following experiment. I fixate with one eye a distant object and cover the lower part of the field, including the hands and arms, by means of a sheet of paper. If I then lift my forefinger behind the paper and try to bring it in the line of the object, the finger will come into view somewhat left of the object when the right eye is used, somewhat right of the object if the left eye is used. An exactly opposite result occurs when the object is near and the finger rises behind it. In all these cases, as Hering says, we refer the object to the root of the nose, and place the finger in the line uniting this point and the fixated object.

The perception of direction in binocular vision, which this experiment shows to be the normal one, is assisted by the motor feelings which accompany the combined movements of the eyes.

Of these combined movements it is unnecessary to speak very fully here. As the reader knows, they are determined by the prime necessity of binocular vision, which is the simultaneous reception of an image of the object to be viewed on the area of perfect vision (the yellow spot) in each retina.

It is an interesting question how far these combinations are fixed from the first by certain mechanical arrangements. That they are modifiable within certain limits has been shown by Helmholtz, who succeeded in making the axes divergent and in giving them different elevations when by certain artificial arrangements these positions were necessary for distinct conjoint vision by the yellow spots.\*

Returning now to the perception of direction, we infer from the observations already made that in binocular vision the eyes do not separately estimate the direction of an object in relation to themselves, but that they each estimate it in relation to a point midway between their centres of rotation. The supposition that each eye projects its retinal impression along the line

\* The first deviation may be effected by a stereoscopic arrangement in which by interposing two prisms the centres of the pictures could only be fixated by diverging axes. The second deviation is brought about by holding a prism before one eye with its angle of refraction uppermost.

of the optic axis appears to rest on the fallacious assumption, that when we look at objects we are conscious not only of the position of the retinal picture but also of the course of the incoming rays. But of this more will have to be said by and by.

In binocular vision, then, absolute direction is clearly estimated by the sum of the motor feelings arising from the movements of the two eyes. In moving the eyes from one point to another the amounts of movement executed by the two eyes are not always equal. Thus the movement described in Hering's experiment involves a movement of one eye only. So when the axes are directed to a point very far to the right or to the left a movement to a new object involves a larger sweep of movement in the nearer than in the further eye. It follows then that in judging of direction we are somehow conscious of the amount of movement executed by each eye, and estimate any given change of direction by means of the sum or combination of these feelings.

Before leaving the subject of direction I may refer to a curious experiment of Helmholtz which illustrates the relation of the perception of direction by the eye to that by the organs of touch and movement. How this relation is to be conceived will of course vary according to the general theory of the space-intuition. Of this more will be said hereafter. That the two modes of perception agree is incontestable. Helmholtz has shown how they can be made to disagree and afterwards be re-adjusted. He placed two prisms in the frame of a pair of spectacles with their angles of refraction turned to the left. Objects looked at through these appeared shifted to the left. He then fixated some particular object, shut his eyes, and tried to reach the object with his forefinger. He found of course that the finger passed to the left of the object. When, however, the trial has been repeated a number of times, and still more quickly after the hand is brought into the field and its movements guided by the eye under the new circumstances, the attempt to reach an object is successful. If, further, when this stage is reached the prisms are taken away, an object is fixated, and another attempt is then made with closed eyes to reach it, the finger misses the object, now passing to the right of it.

One other result of the experiment deserves to be named. Even when in re-adjusting the movements of the hand to the new and artificially changed visual impressions only the right hand has been employed, it is found that the left hand is at once capable of executing the required movements.

It might be supposed that the sense of direction is absolutely determined when once the movements and positions of the eyes are known. Yet it appears that experience may so far influence

our judgment as to cause within certain limits an apparent change of direction of an object when there exists a powerful disposition to think of it as moving. Thus, for example, to refer to an observation mentioned by Wundt, when we look at the clouds flying over the moon we instinctively attribute the movement to the moon. The reason of this is, as Wundt says, that we are constantly seeing small objects move, rarely large objects.\*

It has been assumed here that in binocular vision the direction of an object is the same for each retina. This is not invariably the case for objects seen in indirect vision. The exceptions to the rule will have to be spoken of presently when we take up the subject of double vision.

Let us now pass to the second element in the binocular perception of space, namely distance, or as the Germans say, depth. The distance of an object is estimated either relatively, that is in relation to some other object, or absolutely, that is according to some constant standard. We will first touch on the perception of relative distance.

In appreciating a very minute distance between two objects there are two conceivable elements on which our judgment may be based. In the first place the optical axis may remain fixed. In this case the perception will rest exclusively on the difference in the relative positions of the parts of the two retinal pictures due to the inequality of distance of the corresponding object-points. In the second place the eyes may be supposed to move from one point to another, and so the perception of difference in distance to arise through a change in the feeling of convergence. Helmholtz adopts the former supposition. He dwells on the delicacy of the discriminative sensibility of the elements of the two retinas as seen in stereoscopic perception. Thus, for example, two successive impressions from a printing press when stereoscopically combined give a perception of words and letters lying before and behind one another, the reason of this being the introduction of very slight changes in the distances of the letters from one another in the two impressions. Helmholtz has also measured the limits of this discriminative sensibility by means of an experiment which I have elsewhere described (*Sensation and Intuition*, p. 55), proving that the delicacy of the discriminative sensibility of the two retinas is precisely the same as that of a single retina. That is to say, a displacement of the image of one retina relatively to that of the other is recognised when it amounts to the minimum distance between two retinal images which is recognised as such by the single eye.

\* Of course the allusion disappears when we steadily fixate the moon.



On the other hand, Wundt in his latest work, when giving the results of certain experiments of his own touching the limits of the feeling of convergence, argues that the finest discriminations of distance rest on the feelings attending ocular movement. He found that the minimum change of distance of a vertical thread noticeable did not always correspond to one and the same displacement of the retinal images, but that it varied inversely as the absolute distance. In other words, the nearer the thread to the eyes, the greater the least change of distance perceptible.\* Wundt would account for the agreement between the discriminative sensibility of the two retinas under the most favourable circumstances (*viz.*, with the least possible degree of convergence) and that of a single retina, by saying that in the finest monocular discrimination of adjacent points the feelings of movement exert an influence. On the point here at issue between the two eminent observers, something more will have to be said later on.

Let us now pass to the perception of absolute distance. This is found to be far less delicate than that of relative distance. According to Helmholtz "it is one of these elements of judgment which are easily overridden by others which contradict them". Many curious illustrations of the comparative bluntness of this feeling are given by Helmholtz. To these the reader must be referred. One fact respecting the nature of this judgment of distance by the feeling of convergence deserves to be reproduced. If we look at distant objects through two prisms of an angle of refraction of four degrees with their angles turned outwards, we see with *diverging* axes; and yet the objects though appearing a little further than when seen with the naked eyes, do not on the whole look very different. This fact is paralleled by another, namely, that stereoscopic pictures may be combined in a perception of a single object even when the axes are made to diverge. These facts appear to show that what we attend to in judging of absolute distance is the direction and amount of combined movement (convergent or divergent) from a position of average convergence.†

\* Wundt finds that this ratio (about 1 : 50) corresponds approximately with the ratio of the least perceptible differences in linear magnitude, or distance in two dimensions (*vide supra*). He argues from this that the basis of judgment in both cases is the feeling of innervation. Helmholtz suggests that this relation between absolute distance and least change of distance perceptible, may be explained (consistently with his supposition that the judgment is based on the discriminative sensibility of the two retinas) by saying that when the degree of convergence increases it becomes more difficult to keep the eyes fixed on a point, and consequently to estimate a displacement of the retinal pictures.

† Another curious point connected with the binocular judgment of distance is the error to which we are liable in estimating vertical lines

We may now pass to what seems to be the most complicated department in binocular visual perception, namely the conditions of double and single vision. The reader may be supposed to be aware of the familiar phenomena of double images which are sometimes seen when the axes of the two eyes converge to a point nearer or further off than the object which is seen double. He is also no doubt aware that the fact of seeing objects single with two eyes has given rise to a curious amount of psychological speculation. Recent observations have done much to define the precise conditions of this single vision, and a careful study of the experiments made will help us to answer the question why objects are seen single, and also to understand more clearly how we reach our visual perceptions of space.

Helmholtz has carefully determined according to the latest researches the limits of this coalescence of images, as it is called, in a single perception. Objects, he tells us, are seen double when they have in the two fields a position relatively to the point of fixation sufficiently dissimilar to be noticed by the eye by help of its measure of distance. We have then to ask what points in the two fields have an apparently similar position relatively to the point of fixation, or what points may be said to cover one another in the common field of the two eyes. These points are called 'corresponding points' or 'covering points'. We may of course equally well speak of corresponding points in the two retinas, meaning those which answer to these objectively projected points in the two partial fields. They include first of all the points of fixation themselves. At the same time the two centres of the retinal yellow spots are not always corresponding points. This is proved by the case of squinters whose retinal points of fixation do not correspond with the centres of the yellow spots. Again the retinal horizons, that is, the meridians which co-incide with the plane of vision in the primary position of the eyes, correspond. The other corresponding points are determined by these, namely, the retinal points of fixation and the retinal horizons. Thus the retinal meridians which

under different circumstances. Hering and Helmholtz find that an actually vertical thread is perceived to be such with great accuracy if the eyes are in their primary position and the thread falls exactly in the median plane passing midway between the two eyes. If, however, the head is a little raised or depressed so that the plane of vision (that is the plane which contains the axes of vision) is no longer in its primary position, a thread which is to appear vertical must really incline towards the observer either at its upper or under extremity. Helmholtz explains this by help of the consideration already dwelt on, that with converging axes the direction and situation of objects are so judged as if the eye had a direction parallel to the mean direction of the axes, and the corresponding amount of rotation.

correspond to the apparently vertical direction of lines \* cover one another. Again those points in the apparently vertical meridians which correspond must be equi-distant from the retinal horizons, and points in these last which correspond must be equi-distant from the point of fixation.†

Helmholtz reasons that the position of these corresponding points is determined by the frequency of the co-existence of impressions from one and the same object-point. Thus, as we have seen, the points of perfect vision only correspond in the case of normal eyes when they are also points of fixation. So again the distinguished position of the retinal horizons as corresponding regions is due to the same principle. The meridians which coincide with the plane of vision in any given position of the eyes are the only ones which will always receive a series of images of the same object-points quite irrespectively of the form and situation of the object. Also it is manifest that the retinal horizons are, of all the meridians which ever coincide with the plane of vision, those which will most frequently receive impressions from one and the same objective line, on the supposition that the primary position is the usual one.

Next to determining what are corresponding points in the two retinas and their projections, comes the task of determining what are corresponding points in objective space. That is to say, we have to find out what points of real objective space project their images on corresponding retinal points and consequently are (as a rule) seen single. This will, of course, vary with different positions of the eyes, and the directions of the optical axes. That portion of space which includes all such

\* These meridians are called by Helmholtz apparently vertical to the retinal horizons. The meaning of their deviation from strict verticality will be spoken of presently.

† These corresponding retinal points of Helmholtz are of course fixed, and the same for all the positions of the eyes. As will be seen presently their impressions do not in every case coalesce in a single perception. Wundt tries to meet these facts by introducing a different terminology. He calls (1) 'identical points' those which receive the same images from an object infinitely distant (the eyes' axes being parallel). From these he distinguishes (2) 'corresponding points' viz., those points of which the impressions most frequently coalesce in a single sensation. The first is an anatomical conception, the second a physiological. Finally he marks off (3) 'covering points' (*Deckpunkte*) of which the impressions are referred to a single object in any given case. Class (2) vary slightly with different individuals, whereas class (1) are constant for all. Both (1) and (2) are the same in the same individual for all positions of the eyes, whereas (3) vary with the position. Class (2) often coincide with class (3) but not always. These distinctions are no doubt valuable in understanding the phenomena of double and single vision. Yet I have thought it best in this case to follow Helmholtz's simpler method of description.

points is known as the 'horopter'. The precise determination of the horopter is a difficult mathematical problem which does not specially concern us here.

One fact, however, must be mentioned. If the eyes are fixed on a point infinitely distant in the median plane, it is found that in the lower regions of the field the horopter is not a curve as in the upper regions but coincides approximately with the plane of our feet—that is, the plane of the ground on which we stand. Helmholtz ingeniously argues that this fact serves to account for the well-known fact that a line exactly vertical appears to the single eye slightly oblique. In other words, the meridian of the retina corresponding to the perception of the vertical is not exactly vertical. Helmholtz supposes that when we use two eyes and look at the distant field we are wont to attend (in indirect vision) much more to the many forms lying below the horizon in the plane of the ground than the few lying above in the sky. Hence we acquire the habit "of localising alike the images of these retinal points on which as we walk the same points of the ground are wont to be imaged". In other words, a line drawn on the ground in the median plane of our body comes to be seen as single though its retinal images are not parallel but converge upwards. Now this inclination of the images of our imaginary line is found to be the same, both in direction and in magnitude, as the inclination of the retinal image which answers to an apparently vertical line as seen by the single eye. The facts prove that the monocular perception of direction has been developed out of binocular experience. The norm for the vertical direction to the single eye is supplied by the receding line in the plane of the ground as seen by the two eyes.\*

After thus determining what dimensions are viewed as the same in the two fields, Helmholtz proceeds to investigate the delicacy of this comparison of the fields. This, he tells us, is very nice so far as it enters into the judgment of solidity, though it is comparatively inexact in relation to the recognition of double

\* Wundt thinks that this obliquity of the apparently vertical meridians is to be explained immediately by means of certain innate peculiarities of the muscular apparatus. This is more especially disposed for vision in an inclined and converging position of the axes. In consequence of this the sinking of the eyes is involuntarily attended with a convergent movement, and the raising of them with a divergent movement. This happens if we try to move our eye in a vertical direction upwards or downwards. Accordingly this really oblique movement is regarded as that which corresponds to a vertical direction in the field of vision. At the same time Wundt adopts the idea of Helmholtz respecting the influence of binocular vision on the single eye's perception of the vertical, and supposes that the mechanism of the ocular muscles has in this case adjusted itself to the needs of normal, that is, binocular vision.

images and the comparison of their positions in the two fields. With respect to the discrimination of the images of the fields which serves as a basis for the perception of solidity, the eyes' judgment is found to be most exact in relation to objects lying in the horopter, and becomes less and less exact as the distance from this increases. Thus the perception of relief is particularly exact in the plane of the ground. This may be seen by comparing the exact stereoscopic impression given by this plane under ordinary circumstances with the impression made by looking at the horizon with head bent sideways or, still better, with head bent down so that objects are looked at between the legs.\* In these cases, as Helmholtz points out, we see "the farther portions of the ground no longer as horizontal but as a wall painted on the surface of the sky."† The element of solidity and relief being much better appreciated in the case of objects lying in the horopter, we are accustomed instinctively to bring objects which we have to observe carefully, as far as possible, into the horopter.

Let us now pass to the second mode of comparing the two fields, *viz.*, that which subserves the perception of the apparent distribution of objects in the common field of vision, and the discrimination of double images. This is found to be exact only in the middle of the field, being liable to be very inexact in the peripheral regions. The conscious separation of double images is rendered impossible by a number of psychical conditions, foremost among which is a pre-existing conception of the unity of the object which projects the images. Certain precautions have to be taken in most cases in order to recognise double images at all, and even then the comparative estimation of spacial magnitudes by this means is much less exact than that of similar magnitudes in a single field.

The reader must be referred to Helmholtz's work itself for a full account of the circumstances which affect and limit this power of recognising double images, or in other words the conditions which determine whether the two images are fused in a single perception or recognised as double. The experiments in combining stereoscopically pairs of drawings, which are here described, are exceedingly interesting, and can easily be carried out by every reader for himself even without the aid of a stereo-

\* It is well to mount a stone or hillock so that the altitude of the head above the plane be not materially altered.

† Helmholtz refers the increased brilliancy of the colours of a landscape when looked at in this way to the change effected in the perception of relief. So long as this is not disturbed the modifications of the colours of objects by the atmosphere are looked at as the customary attributes of distance, and not attended to in themselves.

scopic apparatus. Here it must suffice to name one or two of the most interesting facts.

The main ground for the coalescence of images which do not fall on corresponding points is their degree of resemblance to the two perspective images projected on the retinas by one and the same object. The greater this is, the more difficult it is to perceive them as two. Double images may often be recognised by means of a strenuous volition aided by a vivid representation of their plurality. Again the recognition of double images as such may be facilitated by the addition of most insignificant incongruities to the two pictures or designs which are to be combined. Once more it is shown by a series of experiments undertaken by Volkmann that images only coalesce when their vertical distance is small. On the other hand the limit of horizontal distance is much greater. It is hardly necessary to add that practice greatly improves the power of distinguishing double images.

Among the most striking facts brought to light in these investigations is that mentioned by Wheatstone, *viz.*, that just as the images of disparate or non-corresponding points may coalesce, so under certain circumstances the images of corresponding points may be projected in different directions and so seen double. This fact has been disputed, but Helmholtz shows that it is a necessary consequence of the coalescence of images of disparate points.

It may be asked whether movement of the eyes is essential to the coalescence of images and to stereoscopic perception. Brücke broaches the theory that all perceptions of depth are gained by movement, and that double images are only got rid of by successively fixating the single points and so seeing them simply. Yet it has been found by Dove that this combination takes place in many instances instantaneously when the pictures are illumined by an electric spark.\* At the same time Helmholtz holds that with the wandering of the eyes over the object the intuition of depth or solidity becomes decidedly more exact and vivid than with the fixation of a point. This he explains by saying that we only perceive difference of depth or distance very nicely when the points happen to fall in the particular horopter of the moment.

In the foregoing investigations the double images resembled the perspective images which are usually received from one and the same object, and in consequence were easily combined as signs of this object. When, however, they are altogether dif-

\* That ocular movement is not essential is proved also, as Helmholtz tells us, by the fact that after-images or spectra may be combined stereoscopically.

ferent, having no such perspective relation to one another, this combination becomes impossible. When, for example, the two fields are filled with quite dissimilar forms, there is no question of combining the impressions in a single perception. Here it is simply a question of seeing the two fields, or one rather than the other. This subject has been studied under the title of "Rivalry of the fields of vision". It concerns us here only so far as it helps to throw light on the nature of the correspondence of the two retinas as exhibited in the binocular perception of space.

In general both images are seen simultaneously and superposed in the field of vision. Yet in certain regions of the field there dominates now the one image now the other. Through an effort of attention either image may be made to extinguish the other. Yet the attention cannot long be kept fixed on either image without the other intruding itself. More especially the image forces itself into consciousness when it has a prominent and striking contour. It is a point in dispute whether two fields, differently coloured ever yield a single composite sensation of colour (e.g., whether a blue and a red field yield the sensation of purple). Helmholtz and some others deny that this is the case, though there are not wanting good authorities on the other side. The perception of lustre which, as Dove has shown, may arise from the stereoscopic combination of impressions of unequal light-intensity, as white and black, is an interesting instance of the coalescence of the impressions of corresponding points. Finally it is found that the colour-impression of one retina may be intensified by contrast with a simultaneous impression of the complementary tint in the other retina.

We may roughly gather up the results of these investigations into the nature of binocular vision as follows: (1) There are no points of the two retinas whose impressions are always and under all conditions indistinguishable. (2) In the normal and mature organ there are certain corresponding points or circles in the two retinas of which the impressions tend with more or less force, varying according to certain psychical conditions of the moment, to coalesce in single perceptions. How these facts have been variously interpreted, I shall try to show in another paper. The real meaning of the correspondence between the two eyes is a *veraxata questio* in the discussions of visual space. It is allowed by all that experience has something to do with the determination of the limits of single vision; but the point is sharply disputed whether this correspondence does not involve as well some connate anatomical connection which serves as a physical basis for a sort of *à priori* disposition to see single objects in a single space.

JAMES SULLY.



## II.—THE PHYSICAL BASIS OF MIND.

UNDER this title Mr. Lewes, in his new volume,\* passes from the general part of his philosophical task to deal with the more special 'Problems of Life and Mind,' and delivers himself on various questions that have lately engrossed much attention. Prominent among these is the question of so-called Animal Automatism, and it is proposed in the following pages to offer some remarks on the subject after considering his handling of it; but first it is necessary, as well as due to Mr. Lewes, to take account of other parts of the volume, which contain the results of long protracted inquiry.

In this country at least, Mr. Lewes holds an almost unique position. He is a philosophical thinker and psychological inquirer who is also a practical worker in physiology; or he is a physiologist whose positive investigations of the innermost phenomena of organic life are guided by trained psychological insight and an ever-present regard to philosophical principles. In either aspect of it, his activity is of prime interest to all who at this present time are concerned about the problems of Life and Mind. Physiological specialists, who naturally are every day more and more encroaching on the psychological domain, may draw much enlightenment from one who knows how to speak their language as well as the other; and psychologists, who have to endure many a sneer for their readiness to eke out subjective observation with second-hand objective discoveries, may repose special confidence in a fellow-inquirer who accepts no physiological results that he does not himself verify. Those parts, therefore, of his present volume where he appears most distinctly in his double character of physiologist and psychologist, or prepares the way for assuming it, have the strongest claim on our attention here. A short preliminary survey of the volume will make plain what they are.

We have first a series of discussions on 'The Nature of Life'. Since it is animal organisms that manifest mind, a clear view of the distinctive character of vital organisation is naturally the primary requisite for understanding that special form of life which mind is. Towards the general argument of his volume, Mr. Lewes here more especially contends that no mechanical expression can ever adequately represent the processes of life; he also impresses, for use later on, the very important distinction

\* *The Physical Basis of Mind*, with illustrations. Being the Second Series of *Problems of Life and Mind*, by GEORGE HENRY LEWES. London: Trübner & Co., 1877. (Vol. I. of the First Series, *The Foundations of a Creed*, appeared in 1874, and Vol. II. in 1875.)

between Property and Function which he had the credit, nearly twenty years ago, of first bringing clearly into view in the physiological science of the present generation. The consideration of vital phenomena is then brought to a close in a long chapter on Evolution, which aims at showing that a struggle for existence is maintained not only among organisms but also among their component tissues and organs, and that the unity of type in organisms is rather to be explained by all-pervading laws of Organic Affinity than by Mr. Darwin's supposition of Unity of Descent. The next section is concerned with 'The Nervous Mechanism,' and contains much destructive criticism of current scientific doctrines, followed up by an exposition of such general notions of the structure and action of the nervous system as the author believes can be affirmed in the present imperfect state of knowledge. Then follows under the heading of 'Animal Automatism,' a somewhat varied collection of dissertations—historical, abstract, polemical—directed to the assertion of "the biological point of view" against a purely mechanical one in treating of mind as related to the living organism. And last, within the present volume, 'The Reflex Theory,' which forms so great a part of the prevalent doctrine of neuro-physiology, is subjected to an elaborate consideration from the same "biological" point of view, taken as it had already been by the author in regard to this particular question when he wrote his well-known popular work *The Physiology of Common Life*.

The last two "problems," while intimately connected, arise naturally out of the "problem" of the Nervous Mechanism as treated by Mr. Lewes, and must be approached through it. On the other hand, the preliminary discussion on the Nature of Life, if its general import is kept in view later on, need not here detain us. Not the least interesting portion, it may only be remarked in passing, is that in which Mr. Lewes seeks to generalise the principle of Natural Selection by extending it to the organised elements of composite animal organisations; as he had already some years ago proposed to amend Mr. Darwin's theory in another direction, namely, by supposing Natural Selection to proceed upon an indefinite number of original protoplasts emerging under similar conditions, instead of the four or five or even one considered by Mr. Darwin himself at once necessary and sufficient to account for all the variety of related organic forms. Mr. Darwin, in reply to the earlier criticism, has admitted (*Origin of Species*, 6th ed., p. 425) the possibility that at the first commencement of life many different forms were evolved, but thinks it may be concluded that in that case only a very few have left modified descendants. One would gladly learn his opinion of the extension now proposed of his famous

theory. Perhaps it may be guessed that he would decline to load the theory with an application so purely speculative, and not unreasonably, considering the difficulty of its verification even within the original limits. It cannot, however, be denied, in view of what is already known of the composition of organisms from living elements, that the question of the origin of species is but one aspect of the general question as to the development of life, and Mr. Lewes does good philosophical work when he raises it in its full implication.

As regards the Nervous Mechanism, Mr. Lewes has long been known to hold unfashionable opinions, which now at last receive a formal expression. He confines himself for the present, indeed, to the more general aspects of the nervous system, reserving the question of the functions of the brain till the physiological exposition can be accompanied by the necessary survey of psychological processes; but, as it stands, his treatment is fraught with observations of deep import to the psychologist. Mr. Lewes is persuaded that a great part of the current doctrine, confidently propounded by anatomists and physiologists and implicitly received by too confiding psychological inquirers, is either wholly baseless or at least not yet based on actual experience. An imaginary anatomy makes fibres run into cells and cells prolong themselves as fibres in a way that no eye has ever seen, all because of a physiological prepossession as to the part played by these particular elements in the nervous system. It is by an over-simplification of the system that these elements are singled out from the whole mass of it, and the proper scientific task of analysis is again overdone when division is arbitrarily made of the system into sides and parts, which are credited with such diverse characters in separation that it becomes impossible to understand how they should form together a system the most coherent and uniform that is. It is difficult not to allow the force of Mr. Lewes's objections against many of the most fundamental positions in the reigning doctrine of neuro-physiology, and the vigour of his criticism, informed as it is by the practice of original experimental work, bespeaks attention to the doctrine (given in outline) which he would substitute, at least provisionally, for the too definite teaching of the schools. Some of his more characteristic views, not now expressed for the first time, have indeed already begun to modify the traditional dogma in the minds of younger physiologists.

The key-note of his doctrine is the assertion of uniformity of structural plan and mode of working in all parts of the nervous system, high and low. This is not denied or is even affirmed, in so many words, by physiologists in general, but they are apt to

couple any such assertion with others which to Mr. Lewes seem to rob it of all its significance—as, for instance, that the action of the lower centres is purely reflex or mechanical; that the action of the higher centres differs in being conscious action; that particular nerve-calls are sensory or motor, or even sensational, or ideational, or emotional; and the like. Not that he either pretends that there is no distinction in the action of the different parts: there is undoubtedly the most marked difference of function or *use*, according as the various collections of nervous elements, distinguished as particular nerves or centres, are connected with different structures in the bodily organism. But this circumstance only makes it the more vitally important, for the comprehension of the system generally, to signalise the fundamental identity of character pervading all its parts, and this Mr. Lewes does by distinguishing (after Bichat) Property from Function, and maintaining that the elements of the system in all their variety, both as elements and when aggregated, manifest everywhere one perfectly characteristic property. This property he speaks of under the two names of “*Neurility*” and “*Sensibility*,” according as it is presented by the nervous lines branching out towards the periphery or by the parts distinguished as central; but, however named, we are to think of a purely objective quality, symbolising a multitude of changes expressible ultimately only in terms of motion. Thus understood, the conception undoubtedly helps to a clear understanding of the whole system of neural processes, which is otherwise apt to be misconceived from the fact that our conscious mental life is obviously related to some of the processes rather than to others, or to some more than to others. There is, besides, positive evidence that native property survives functional appropriation in the well-known facts, established by Vulpian and others, of function becoming experimentally reversed; and Mr. Lewes would even suggest in one place (p. 282) that the same fibres which carry impulse out to the muscles may transmit the muscular reaction as a recurrent stimulus inwards to the centres—a view which, if it could be maintained, would help to reconcile the notoriously opposite interpretations of the muscular sense now prevalent. He also gives due prominence to all the facts tending to show that nerve-fibres are not merely passive carriers, and that the grey matter (for example, in the spinal cord) performs the work of transmission as well as any fibres.

Next to the fundamental uniformity of plan and process throughout the nervous system, it is the actual coherence and solidarity of its parts with unity of action that Mr. Lewes is most concerned to establish against the exaggerated “analysis” of the common physiological view. He objects to the distinction

of peripheral and central parts as artificial, protests against the opposition of sensation and motion if taken to imply the independent and unrelated working of two sides in the nervous system, and seeks above all to bring into relief the diffuse character which nervous disturbance is prone to assume with the effect of implicating the whole organism. He does not, of course, overlook the salient feature of the nervous system known as "isolated conduction," or forget how mental growth through experience depends upon restriction of the original "irradiation"; but he is utterly sceptical as to the efficiency of the medullary sheath which is commonly assigned as the means of insulating the ultimate nerve-lines, while refusing, in the present state of knowledge or ignorance, to hazard any other explanation of the fact in as far as it occurs. That it must not be asserted in any absolute sense, so as to imply fixity or invariability of nervous conduction, he is quite sure: "fluctuation," he is never tired of repeating, is the characteristic at least of central combinations, and this, he more than suggests, may be dependent on the presence of a structural element for which no allowance has been made in the current physiological theories, namely, the so-called Neuroglia. According to some a kind of merely connective tissue, affording mechanical support to the true (fibrous and cellular) elements of the nervous system while itself not neural, this "nerve-cement" seems to Mr. Lewes, whether called neural or not, to play an essential part in all the processes of the system and probably a more important part than even the nerve-cells (p. 246).<sup>\*</sup> In any case, until the network of the Neuroglia is better understood and duly taken into account, there can, he maintains, be no thought of having a theory of the working of the nervous system satisfactorily based, as it should be, on the ground of elementary anatomy. Meanwhile Psychology, in the way of objective help, must be content with such general knowledge as anatomy already affords of continuity and coherence in the nervous system, and for a notion of the physical conditions of mental life must rely rather upon the researches of physiologists and pathologists.

The general representation of the working of the nervous mechanism which Mr. Lewes accordingly proceeds to give at the

<sup>\*</sup> Wundt (*Physiol. Psychologie*, p. 29), after a short anatomical description of the Neuroglia in his text, disposes of it physiologically in a foot-note. He mentions that the body of it, while enclosing cells that are clearly not nervous, has itself a constitution somewhat resembling the protoplasmic contents of ganglionic cells, and that many observers (Wagner, Henle, &c.) have thereby been induced to consider it as nervous in character. But this view, he declares, is wholly at variance with all that is known of the relations subsisting between the fundamental nerve-elements, *viz.*, the ganglionic cells and nerve-fibres.

end of this part of his inquiry, strikes one as marked by a happy mixture of boldness and circumspection. It is, of course, only provisional as well as general, but the way in which he manages, by a comparatively simple theory, to order the chief facts and to suggest consistent explanations of special difficulties, deserves warm acknowledgement. Without following him into his formal expression of laws, some notion may here be given of his view of nervous action by quoting a passage that brings its main points into relief through an apt and instructive simile:—

“Imagine all the nerve-centres to be a connected group of bells varying in size. Every agitation of the connecting wire will more or less agitate all the bells; but since some are heavier than others and some of the cranks less movable, there will be many vibrations of the wire which will cause some bells to sound, others simply to oscillate without sounding, and others not sensibly to oscillate. Even some of the lighter bells will not ring if any external pressure arrests them; or if they are already ringing, the added impulse, not being rhythmically timed, will arrest the ringing. So the stimulus of a sensory nerve agitates its centre, and through it the whole system; usually the stimulation is mainly reflected on the group of muscles innervated from that centre because this is the readiest path of discharge; but it sometimes does not mainly discharge along this path, the line of least resistance lying in another direction; and the discharge never takes place without also irradiating upwards and downwards through the central tissue. Thus irradiated, it falls into the general stream of neural processes; and according to the state in which the various centres are at the moment it modifies their activity” (p. 284).

A notable feature in this view is the treatment of Arrest as but another aspect of Discharge, whereby he gets rid of the complex machinery of inhibitory centres which has become so troublesome in recent physiological theory; but instead of dwelling on this or any other of the interesting questions raised by Mr. Lewes, it must suffice to direct the attention of psychological students to the whole of this closing chapter on the Laws of Nervous Activity, and we may now pass to the third and fourth “problems”. Thus far Mr. Lewes has been treating the nervous system from the anatomical and physiological point of view. Only in the chapter where he introduces his use of the word Sensibility to mark the common property of nerve-centres (as opposed to the common property of peripheral nerves, which he calls Neurility) is he led to refer to the subjective aspect of nerve-processes which, he does not deny, is unavoidably suggested by the word. In spite of the ambiguity he deliberately makes choice of it to designate the objective quality he has in view, and he believes he has his reward in evading, with it and its companion-term Neurility, the more seriously confus-

ing associations of the alternative name Nerve-force. For the subjective aspect of Sensibility he proposes, or rather at once claims as a matter of course, to use the word "Sentience;" and, though in the chapter itself he somewhat curiously interchanges the words as if they meant not only the same thing in different aspects (which he afterwards seeks to prove) but quite the same (subjective) aspect of the thing, yet, on the question of principle, he is most impressive in his distinction of the two aspects, and, while indicating as clearly as possible the respective tasks of physiologist and psychologist in the matter, he confines himself in all the remaining chapters of his second part strictly to the objective view. In the last two parts of the volume, on the other hand, it is the subjective phase of mind that is uppermost—not indeed as viewed in itself by the introspective psychologist but (in accordance with his main title) as that of which the nervous mechanism is the "physical basis". The amount of controversial matter in these two parts makes it somewhat difficult to take an orderly critical survey of his positions. On the whole it seems best to work into his meaning through the discussion of the Reflex Theory which he himself takes last, keeping in view, where necessary, the more general considerations ranged under the head of Animal Automatism.

What is the precise import of the Reflex Theory as understood by physiologists, who do not as a rule trouble themselves much about the full psychological implication of their statements,—may be a matter of question; but Mr. Lewes takes pains to leave us in no doubt as to the counter-theory which he, with his face distinctly set towards psychology, would substitute for it. While the current theory seems to him to assert dogmatically that the nervous processes in lower centres may and do pass as purely physical (or, as they are called, mechanical) changes without having any psychical aspect whatever, he contends that every central nervous process, to the very lowest and simplest, in any organism, intact or truncated, that is not dead, has in and for itself its proper psychical phase or aspect, as much as the highest and most complex cerebral process accompanying or accompanied by that which all understand as a conscious experience. He does not say that the psychical state concomitant with the action of a lower centre is a conscious state—either that the centre is itself endowed with consciousness or that the man or animal is conscious in the case; as indeed, for that matter, he denies that the centres immediately concerned in the higher cerebral process are in themselves the seat of consciousness, or that the man or animal need always be conscious in *this* case. But he does assert that in the one case as well as the other, there is, besides the physical, a real



psychical occurrence which is to be understood in terms of "Feeling" or subjective experience. He commits himself, for example, to the general statement that "Feeling is necessary for reflex action" (p. 435), meaning this at all events, that whenever and wherever a central nervous process goes forward in a living organism there always is present something that may be called Feeling. His favourite expression, however, is that the centre has Sensibility; and, though he may have wished elsewhere to understand by Sensibility a purely physical or objective process—something wholly expressible in terms of matter and motion—here, there can be no doubt, he means by Sensibility a subjective condition as well. This is abundantly clear when, in the course of his argument, he claims for every active centre a power of Discrimination, Memory, &c.; or if it be said, as is sometimes half implied (p. 463), that these terms may after all be understood objectively—*e.g.*, Discrimination as meaning only "neural grouping"—*cadit quaestio*. No upholder of the Reflex Theory, even in Mr. Lewes's statement of it, denies that the centres perform a work of neural grouping, or that, as a plain matter of objective fact, there does appear an "adaptation of the mechanism to varying impulses".

The theory he opposes has, according to Mr. Lewes, nothing to rest on but a mere prejudice as to the brain alone being the seat of sensation. When the actual facts observable in animals (with or without brains) are fairly weighed, especially in the light of what is known of the structure and laws of the nervous system, the theory must give way to a truer representation of the behaviour of the living organism. Presumption against presumption, it is quite the opposite view that is suggested by way of general deduction before looking at the particular evidence. The nervous system, as we saw, has a uniformity of structure and working everywhere, and is also in the truest sense a coherent whole. In as far as it is possible at all to speak of separate action of its parts (this or that centre) in their natural state of union, the processes in all of them appear exactly similar; and, in fact, a process set up anywhere may always implicate the whole system, and through this the organism generally. A reaction of the general organism being the natural outcome of every stimulus, the particular reaction that is at the moment possible for each, amid the multitude of impressions always being received, will determine the character it assumes subjectively. The same kind of impression that at one time appears as a conscious state specially attended to or distinctly felt, may at another time in the crush of impressions not come into consciousness at all; but in being thus unconscious, it does not cease to be subjectively—it does not lapse out

of the domain of Feeling, for at any moment it may again acquire the character of a conscious sensation, if the brain is not otherwise engrossed. So, if the brain is removed altogether without loss of life, we are not to suppose that such reaction as is still possible in the organism has no longer any psychical character, merely because it can no longer appear as it did to the animal that was conscious through the brain. Indeed, if we turn to the actual facts, "instead of marvelling at the disappearance of so many modes of sensibility when the brain is removed, our surprise should rather be to find so many evidences of sensibility after so profound a mutilation of the organism" (p. 439). The facts warrant, according to Mr. Lewes,—especially those placed under the head of Instinct (pp. 463, ff.)—precisely the same *kind* of inference as is forced upon an observer by the deportment of animals in their intact state. With Pflüger, he urges that it is only by inference from objective signs that we ascribe subjective life to any other man or animal, and where the signs, though in the absence of the brain, remain precisely what they were, the inference is not to be evaded.

There is no need to follow Mr. Lewes into his interpretation of the facts, as far as he adduces them, in detail. The point of real significance is to understand the general reason why Sensibility in its full meaning—not as mere "neural grouping"—should be so expressly claimed for the spinal cord. Or it may be said that everything depends on the use to be made of the concession, supposing it were not withheld; for if it is true that the claim can never be proved, it is equally true that it admits of no positive disproof. First, however, we must seek out the true meaning of the Reflex Theory, to see what is the real difference that separates Mr. Lewes and its upholders.

The Reflex Theory, though often enunciated in an incautious or in a half-hearted way, is at bottom nothing but an assertion that, wherever there is nervous stimulation followed by nervous outcome (appearing as movement or otherwise), there is a continuous physical process through the central parts involved, and no hyperphysical or metaphysical agency is to be assumed there for the explanation of the forthcoming result. When first formulated, the statement was confined to the lower centres, but this may have been rather because the processes in these were simple and could be approximately traced than because the cerebral processes were believed to be disparate in kind, that is to say, physically discontinuous, by reason of the intervention of a non-physical agent (the conscious ego) at the higher centres. Or, if indeed some, nay many, assertors of the Reflex Theory have limited it to the spinal column and more

immediately connected parts, under some such notion (more or less vaguely expressed) of a difference of conditions in the brain, this is a weakness or misunderstanding which clearer heads have been able to surmount with the gradual advance of physiological knowledge. The doctrine of Animal Automatism, as Mr. Lewes himself remarks (p. 389), is only the Reflex Theory legitimately carried out; at least, it includes the assertion that all central nervous processes whatever, high as well as low, are physically continuous—that the “nervous arc” is unbroken in the brain just as in the cord. When, therefore, Mr. Lewes urges elsewhere (p. 453), as one objection against the Reflex Theory, that there are cerebral reflexes as well as spinal reflexes, he urges that which consistent supporters of it are themselves most forward to maintain. He does not differ from them seriously even when he would urge that, as cerebral processes in another aspect of them are mental processes, so some kind of mental process may always be assumed as the obverse aspect of a spinal reflex: they do not assert this, but neither do they deny it as a matter of fact in what they do assert. He differs from them radically only if he maintains that Reflex Action is made what it is through the agency of Feeling—that “Feeling is necessary for Reflex Action” in the sense that without the presence or interposition of feeling reflex action cannot be conceived as proceeding.

Now it is impossible to doubt that this or something very like it is Mr. Lewes's meaning, and that he evidently thinks he thereby makes a distinct advance towards a scientific comprehension of Mind. This is the object he has in view throughout his whole argument, and not the gratification of any mere fancy for harmonious philosophical expression. Others have indulged in speculation as to an unconscious mental life bound up with the action of the spinal cord, and, not stopping there, have interpreted in an analogous manner the vital processes in plants and completed their philosophical sweep by supposing every change or motion in the physical world to be in some shadowy fashion the direct manifestation of a mind or mental principle. Mr. Lewes does not go so far a-field. He finds no argument on the so-called sensitiveness of plants, to say nothing of simpler physical processes; he does not assert that wherever the property of Neurility is manifested, as in detached portions of nerve, there we must also assume the presence of some sort of subjective feeling; nay, even when there is distinct “neural grouping,” and thus evidence of the *objective* property of Sensibility, as when the cheek of a guillotined victim responds with blushing to a stroke, he scouts the notion of the blow being felt (p. 439). But wherever there is an animal organism, either

living as it naturally lives or, however mutilated, able to retain life, all its central actions, he maintains, are what they are—actions of a living thing and not motions of a dead mechanism—only by virtue of Feeling, and if not first viewed as felt they are wholly unintelligible.

What, then, is the precise difference between a Living Organism—at least an animal organism with a nervous system—and a mere Mechanism or Machine, which renders it necessary to assume feeling as the ground of all action in the former? This is a critical question which Mr. Lewes raises over and over again within his volume, and strives to answer in the most determinate way. His answer always turns more or less upon the point that an organism is peculiar in showing selective adaptation in all its acts, that is, varying combination of motor impulses to suit the varying requirements of the effect to be at any time produced, or, as he also puts it, fluctuating combination of elements in response to variations of stimuli. This, he holds, is found in no machine; nor has a machine either that primary constitution, distinctive of organisms, which appears as their inherited specific nature, or a history, in the sense of having its primitive adjustments modifiable through development of structure brought to pass by the very fact of its working experience. Otherwise, in his many discussions of the subject, he urges that, however organisms may exhibit phenomena referable to physical and chemical agencies, they also exhibit others that can never be expressed in terms of these; and, again, that the organism is no mere mechanism, because mechanics can assign only the abstract laws of its movements, and cannot account for its behaviour in the concrete.

The statements may pass for what they are worth; but even if they were unexceptionable—which the last, for example, hardly is, since mechanics gives no more than the abstract laws of the motion of any body whatever—they yet fail to prove anything as to the efficacy of Feeling in organic processes. It is accordingly by another line of argument that Mr. Lewes really seeks to establish his general position. He does not so much build any conclusion on the shortcomings of the Reflex Theory, as reject this because he has already satisfied himself that where conscious feeling is allowed by all to be present, it determines the nervous processes to be what they are in the living organism. Here, then, we turn expressly to his view of the doctrine of Animal Automatism. An outgrowth (in its recent statement at least) from the Reflex Theory, it may perhaps be so overthrown as to uproot the Reflex Theory with it. Its central idea, now become familiar to all, is that consciousness, although present, does not count for anything in the vital history of man

or animal—that all animal actions may be completely expressed and accounted for in terms of (nervous) matter and motion without the interposition of feeling as a factor at any point of the course and indeed without any reference whatever to conscious experience. Supposing this were true, there is obviously a very intelligible sense in which it can be said that everything proceeds mechanically in the living organism: not that there is no difference between a biological process and a simple physical movement, any more than there is no difference between a chemical reaction and the rebound of a ball, but in the sense that just as a chemical process can and must always be interpreted ultimately in terms of motion, so a nervous event must likewise in the end be so interpreted. Be this point of expression, however, as it may, Mr. Lewes is by no means disposed to grant the main position. He contests the ground inch by inch with Professor Huxley who some years ago gave an impressive exposition of the doctrine of Automatism, and, what is more, he enters upon a line of consideration which not only, as it seems to him, affords the deepest reason for asserting Feeling to be an agent in the vital procedure of man or animal, but also yields a strictly psychological solution of the general question of the relation between Body and Mind.

As a metaphysician, Mr. Lewes is a monist who declares that objective Motion and subjective Feeling are but two aspects of one and the same real, but he confesses that he did not always clearly see *how* a physical process could also be a psychical process. Even now, in a chapter (on Body and Mind) that is otherwise marked by great insight and subtlety of expression, there is some want of clearness or consistency in the explanation that is offered; but his general drift is unmistakeable and is to the effect that what we call Matter and Mind, Object and Subject, are symbols of different modes of feeling or sentience, which may both represent the same real, just as one tuning-fork may appear moving to the eye and sounding to the ear. The two differ merely in the mode of apprehension. Still they do differ, and nobody could more impressively urge than does Mr. Lewes in this chapter (see especially p. 342, as at the earlier stage before referred to, p. 193), that there must be no mixing-up of the different aspects—that when we are talking in terms of Matter and Motion, *i.e.*, “optico-tactical experiences accompanied by muscular experiences,” we must not shift about and pass over into the phase of specially subjective experience for which the comprehensive symbol is Mind, nor *vice versa*. Thus, if by positing only a difference of psychological aspects, not a difference of substances, he is not saddled with the metaphysical difficulties of Dualism, he also, by taking the different aspects

as equally independent, avoids the error of those who are prone to sacrifice the subjective to the objective aspect, speaking of the terms of the physical series as the causes of the corresponding psychical terms in a sense which does not admit of being reversed—as if, that is to say, the one were always to be absolutely assumed, while the other may be considered or neglected at will. And yet he is perfectly aware of the special scientific advantage there is in seeking for an objective expression of the facts of subjective experience, which, though it never should be declared a mere accident of the series of physiological processes, does yet, as subjective, not admit of the same rigour of scientific statement.

This, then, is the argument, and so far it might seem intended for the rescue of Feeling from the subordinate position to which it has too often been improperly consigned, and the establishment of a thorough-going parallelism of the physical and psychical; but now we have to learn that Mr. Lewes's real meaning is very different. Because the objective series of nervous processes and the subjective series of corresponding mental states may both, in ultimate psychological analysis, be regarded as modes of feeling in some consciousness or other, this is to be a reason for declaring that Feeling—meaning always a mental state in the subjective series—may and does enter as a term into the objective series, which, as properly objective, consists of molecular movements in nerve. Let the reader, in particular, refer to p. 403 where, after his long combat with Prof. Huxley, Mr. Lewes proceeds to sum up his argument on the special question of so-called Automatism. There we are reminded once again that, though we may believe Consciousness, which is a purely subjective process, to be objectively a neural process, we are nevertheless passing out of the region of physiology when we speak of Feeling determining Action: motion may determine motion, but feeling can only determine feeling. Yet we do, says Mr. Lewes, speak of Feeling determining Action, and we “are justified: for thereby we implicitly declare what Psychology implicitly teaches, namely, that these two widely different aspects, objective and subjective, are but the two faces of one and the same reality. It is thus indifferent whether we say a sensation is a neural process or a mental process—a molecular change in the nervous system or a change in Feeling. It is either and it is both.” Certainly, it is here made clear why Mr. Lewes has previously permitted himself to use the same word Sensibility to express the objective fact of neural grouping and also a fact of subjective experience; but with what reason he denounces those who, when they are speaking in terms of matter and motion, cannot keep to their

text but will persist in dragging-in terms of subjective import—is not so clear. Why should they not use the subjective words? How do they go beyond the reckoning, when it is exactly the same thing they are speaking about in the one language or in the other? Or is Mr. Lewes's meaning this—that the physiologist indeed must keep, like any other physical inquirer, to the sphere of the objective in which he finds himself and which he cannot explain, but the psychologist is at liberty to pass at will between the subjective and the objective spheres because *he* knows and can prove them to be one in reality? If this be so, surely the psychologist's fate is hard. Alas for his insight if it must be the death of his science—if it shows him the same thing with two different sides to be named and will not suffer him to speak consistently about either!

Now let us note, before closing the account, two other positions taken by Mr. Lewes that are in different ways remarkable. One is where he declares at the end of his whole argument (p. 409), that “the question of Automatism may be summarily disposed of by a reference to the irresistible evidence each man carries in his own consciousness that his actions are frequently—even if not always—determined by feelings. He is quite certain that he is not an automaton and that his feelings are not simply collateral products of his actions, without the power of modifying or originating them.” And Mr. Lewes adds, “this fundamental fact cannot be displaced by any theoretical explanation of its factors”. One reads the words with a certain surprise. There may be reason indeed for protesting against such an incautious statement as that feelings are “products” of (nervous) actions: all that Mr. Lewes urges anywhere against attempting to explain the psychical series as dependent on the physical series, is much to the point. An Automatist who contends for pure parallelism of the physical and the mental, must no more think of breaking the mental line for the physical than the physical for the mental, nor has he a right to view the mental as a discontinuous efflux from the unbroken chain of nervous events. But the bare suggestion that any scientific deliverance on the subject can be based upon the immediate evidence of consciousness, is somewhat confounding when it comes from Mr. Lewes. The end of that kind of reference in questions of philosophy is but too well known. If it were allowed in this particular case, what becomes of the parallelism of aspects which nobody maintains more strongly or on deeper grounds than Mr. Lewes? He would break it in one direction as much as he charges Prof. Huxley with breaking it in the other. But, indeed, from the point of view of direct consciousness, what question is there of a parallelism at all? That a



nervous process represents one purely phenomenal aspect of what, on another purely phenomenal aspect, is a conscious mental state, may be a very profound truth, but it never was ascertained on direct evidence of consciousness, which, in the sense in which it ever may be said to take account of nervous processes, views them as physical changes in a material structure supposed to exist apart. Nor, whatever reason or excuse there may be for the natural conviction we have as to a relation between feeling and bodily action, can this be allowed to affect one way or another the validity of the philosophical interpretation.

The other statement referred to occurs at an earlier part of the argument, but is here taken last because it gives occasion for the few remarks on the doctrine of so-called Automatism which will bring this article to a close. Can we translate all psychological phenomena into mechanical terms? asks Mr. Lewes at p. 352, and he replies (for reasons before mentioned) that we cannot—"nay, that we cannot even translate them all into physiological terms . . . nor can the laws of Mind be deduced from physiological processes, unless supplemented by and interpreted by psychical conditions individual and social." It is important to take account of this last remark (though it is not followed out at the place or anywhere adequately enforced throughout the discussion), because otherwise the denial of the possibility of expressing mental phenomena in physiological terms would stand in sharp contradiction with all that the author so often says about neural and mental processes. Plainly, he cannot mean that there is not an exact physiological expression (if it could be obtained) for every psychological phenomenon. He rather means (I can only suppose) that just in the sense in which a biological phenomenon is more than a chemical one, so a psychological phenomenon is more than a biological. And this is a most important consideration, which if fully grasped may lead us to see that the notion of Automatism fails to express just that which is most characteristic in the life of Mind. But for this a little explanation is necessary.

It was said above that there is a sense in which the expression of biological phenomena in purely objective terms of motion may be called a mechanical view of them. Does this mean that from the principles of mechanics it is possible to deduce the phenomena of life? Not at all. It only means that, as life is manifested by a material structure, no vital change, when it happens, can be interpreted otherwise than as some more or less complex phenomenon of motion. More immediately, in many cases, the vital change may have to be phrased as a chemical process, but this, it is not denied, is a peculiar mode of

motion—some re-arrangement, let us say, of atoms in space; and mechanics (or general physics) contains the laws of all such change of position. Of course there is nothing absolute or final in such an expression of chemical and biological phenomena. Even supposing we could assign to the minutest particular all the motions or re-arrangements in space that constitute a chemical or a biological phenomenon—supposing, that is to say, we had found the complete physical or mechanical expression—it would still remain a problem to find the purely mathematical expression of this physical expression; and, again, the full mathematical expression, if it could be found, might be viewed as the result of a conceivable logical combination. But short of this last stage, at which the problem ceases to belong to objective science, it has come to be thought sufficient in modern times to find the mechanical expression for any material phenomenon, because motion admits of definite measurement; and hence the idea that such an expression constitutes an ideal explanation. However, just as the laws of motion cannot themselves be deduced from mathematical principles without data from experience, so, I repeat, there is no question of merging chemistry or biology in physics, in seeking for a mechanical interpretation of chemical and vital phenomena. Chemical processes must be investigated in the special conditions under which they appear in our experience—only always in the light of physical principles; vital processes likewise—only always in the light of physical and chemical principles. And so also mental phenomena, while studied in the light of biological principles and the others implied in these, have to be investigated in the special conditions that are found to determine them. They doubtless admit of translation into physiological terms, but physiology can never explain their rise.

Now the doctrine of Automatism declares that the state of the living organism, more particularly the nervous system, is at any moment the effect of its state immediately preceding and the cause of its state immediately succeeding; just as an automaton, or mechanism involving some internal principle of motion, goes through a series of operations each of which in turn brings on the next. As a matter of fact, the various nervous processes, as they are successively brought to pass, have or may have subjective concomitants, which are called, in the cases where they excite attention, states of conscious experience; but none of these have the least real influence in determining the next condition of the organism, or (as it should be, but is not always, clearly understood and expressed) are themselves determined by the accompanying or the foregoing organic states—at least in the sense in which these are causally related to one

another. Though the presence of consciousness makes the man or animal a *conscious* automaton, all the vital acts that are commonly called mental are, it is said, truly those of an automaton inasmuch as they are physically predetermined and would come to pass equally though consciousness were wholly absent. The doctrine is thus something more than a mere extension of the Reflex Theory, as it was previously described. As the name Automatism suggests, the organism is supposed to have within itself a principle of action whereby the succession of nervous processes, both cerebral and spinal, is physically determined; and the direct implication is that the life of man or animal not only may be considered as a set of purely physical occurrences, but cannot otherwise be scientifically regarded.

Now, if this is at all a true representation of the theory of Animal Automatism, it is surely quite inadequate as an expression of the facts of mental life. The state of the brain or whole nervous system at any moment is always one factor in the causation of its succeeding state, but, at least in all cases where anything of the nature of a new mental experience or acquisition is involved, it is one factor only. If we consider how many and what kind of factors may co-operate in producing the physiological condition (of brain, &c.) which corresponds with that which we call (subjectively) a mental judgment—even a very simple one—we are obviously face to face with a phenomenon belonging to an altogether peculiar order of occurrence. Using the word in the first instance merely for discrimination, we have in the *mental* phenomenon something at the least as much more complex than a vital phenomenon as this is more complex than a chemical phenomenon. And whether or not there is any scientific advantage (perhaps there is not much) in likening the multiplicity of vital reactions to the reaction of an automaton, because both are motions determined largely from within,—in the case of mental phenomena, at all events, the comparison is unsatisfactory in every way. While the reference to any internal mechanical arrangement that may be devised gives, on the one hand, hardly the least notion of the marvellous organisation of the nervous system, slowly developed as this has been in and through actual working, it gives, on the other hand, an exaggerated notion of its independent activity as the organ of what is specially called Mind. For all its apparent spontaneity, the nervous system as the organ of mind works mainly in response to stimuli supplied by the natural and social environments. Even if nothing had to be said about a subjective representation of these, to overlook them as factors in the peculiar result which follows from them is to omit all that is most characteristic in the case.

But it may be said that it is no part of the doctrine to exclude reference to the external factors: what is really contended for is the right to express all the factors, internal or external, in physical terms, or rather the scientific necessity of so doing, and the right to discount all reference to conscious or subjective experience as irrelevant to the scientific issue, whatever other interest it may happen to possess. And truly, though the word Automatism is quite inappropriate as an expression for this conception, it is not for a moment to be denied that the mental life from first to last in all its phases—its potencies, its actuality, its very aspirations and ideals—admits conceivably of physical expression. But the grave mistake, nay the profound error, is to think of building the science of mind upon such a foundation—is to fancy that this way of looking at mind is the only scientific way or even, in the actual circumstances, at all truly scientific. Would it be right to defer the study of life till physics and chemistry with mathematics are sufficiently developed to furnish a deduction of it, or, if not wholly deferring the study, are inquirers bound to refrain from establishing any facts or laws which they cannot exactly express in terms of chemistry and physics? Physiologists, by their practice, answer emphatically No, and theoretically they might urge that the chance of ever finding the physico-chemical expression of vital phenomena (to say nothing of their fully reasoned construction) depends not least on the prior ascertainment of the phenomena as vital. With what reason, then, can the impression, or even (as it may be and is) the well-grounded conviction, that mind in all its phases has its physical equivalent, whereby it is brought within the realm of objective nature and may on this side conceivably be studied—with what reason can this conviction be urged against the study of subjective mind, or be made the ground of a serious assertion that consciousness is a mere accident of a certain determinate succession of physical events, when, but as they are subjectively represented, the factors whereon the events depend could not be discerned and brought within the view of scientific inquiry? A possible assertion it, no doubt, is, and there may even be some use in making it by the way, as a means of lending impressiveness to the affirmation of the never-failing physical aspect of the mental life. But it is no serious assertion to rest in with a view to science, for the reason just given. The conditions natural and social upon which mind and the corresponding series of organic states in point of fact depend, would never come into view at all except in the guise of properly conscious or psychological experience. Only, as we are first conscious of influences received from the world of nature and (through speech and otherwise) from our fellow-men, can we afterwards have

any true idea of all the (physical) circumstances entering into the causation of that series of nervous positions which we may come to think of as co-existing with the flow of our subjective life. How then can this be truly described as accidental in the case? And let it be observed that here the argument is conducted strictly from the point of view of phenomenal science. We may leave out of sight that deeper philosophical consideration, according to which the series of complex physiological events itself appears in ultimate analysis as compacted of a special class of conscious experiences.

In my opinion, the Reflex Theory and the more developed Automatic Theory err not in what they really affirm but in what they are understood by many of their advocates to deny. When the Reflex Theory is supposed to mean that the nervous action of the spinal cord is in no way related to the life of subjective experience, it goes beyond the evidence, even although there can be no proof positive of the counter-assertion that every central nervous process is at the same time, in another point of view, a fact of mental experience conforming to psychological law. When the Automatic Theory is given out as meaning that conscious experience has no scientific import, it not only goes beyond the evidence but bars the way against the kind of psychological investigation that practically and theoretically can best be justified. The Reflex Theory brings into view a consideration of great scientific moment when it declares that, without the least reference to conscious or any kind of subjective experience, there is physical provision in the nervous system for the accomplishment of acts most deeply affecting the well-being of the organism. It only errs if it is understood to imply that there is no further question to be asked about such arrangements and that they cannot be at all viewed, either in their origin or in their developed form, as related to the mental life. So also the Automatic Theory advances science when it suggests as a constant problem the expression of all mental phenomena in those objective terms which can be made so much more definite than subjective expression ever is. But it impedes science when it discourages the specific study of mind in all the variety of its actual conditions and manifestations—for the sake of a premature and barren physiological deduction. Will any brooding over physiological data lead to anything but the most vague and general results in the way of psychological inference? Nobody who reflects will pretend that it can; and one must go farther and deny that even the vaguest psychological conclusion can be so obtained, unless with the physiological data there be coupled unawares some data of purely psychological, which is to say subjective, experience. I would not quarrel with the

theory of Automatism on the ground most commonly taken. Though it gives a very inadequate expression to the infinite variety of circumstances determining human actions as viewed objectively, people must learn to be content with the plain truth that man, however he may be "man" (which is saying much), is not "master of his fate," but has his part and lot in the destiny of that—whatever it may be—which is called the physical world. But this truth is little towards all that we want to know of our strange double-sided human existence, and we cannot know more if our scientific activity is to be limited to such abstract theorising as finds expression in the doctrine of Automatism. Mental life can never be understood either in its essence or in its fullness, unless it is studied directly alike as it discloses itself to subjective introspection and as it is manifested more broadly in social relations and in the record of history.

The conclusion of the whole matter is that Psychology, however it may be related to biology, must be upheld as a perfectly distinct science—in no sense less distinct than chemistry is from physics, and in truth much more distinct because of the transition from the objective to the subjective point of view. And, returning to Mr. Lewes who has shown himself among the first—who claims indeed in his present preface to have been quite the first—to understand Psychology as the science of Mind in its wider implications, I cannot but venture the opinion that he has not now made all the use that might have been expected of his insight in dealing with the fallacy of "Animal Automatism".

EDITOR.

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### III.—THE USE OF HYPOTHESES.

THE thorough working out of that general view of the nature and province of Logic which, for the sake of brevity, may be termed the Material or Objective view, throws a new light upon, and therefore demands a reconsideration of, a good many detached points. Amongst these, as it seems to me, is the question of the nature and functions of Hypotheses.

We must first ascertain what, for the purposes of this inquiry, is to be understood by the term Hypothesis, especially since the use of the word in any kind of logical discussion will probably suggest a narrower limitation than that which will here be adopted. We need not strive after rigid accuracy, but half a page will be well expended if it aids in indicating what we have in view and in calling attention to various cautions which are often neglected. What will here be understood by the term,

then, is, briefly speaking, nothing else than a mental representation, or conception of our own, which is either known or suspected not to be in accordance with actual facts. It would be a truism to say that for all ordinary purposes our conceptions should be in entire accordance with fact, so far as this is attainable. Often they are so, or are fully believed to be so, and they then go by various names according to conditions of time or mode of acquirement. If they refer to future events we might term them predictions or confident anticipations; if to the past, and within our own experience, recollections, and so on. Often, however, we have occasion to picture to ourselves a state of things which we deliberately contemplate as not-actual; it may be merely that the things are considered as uncertain, it may be that they are utterly and even whimsically false. With regard to their nature they may be either concrete facts, or groups of facts, or properties of bodies, or laws of connection or succession, which we thus picture to ourselves as other than they are. Such suppositions as these, in so far as they are seriously made for scientific or practical purposes, and not with any prominently æsthetic or humorous aim, may be roughly taken to correspond to 'hypotheses' as we are here concerned with them. The account thus sketched out may seem at first sight to have no very close connection with the term in many of its common significations; but it will be found, it is hoped, to be a consistent one, and we must trust for its justification to the discussion which follows.

The remarks just made imply the existence or assumption of a tolerably sharp distinction between the objective and the subjective, between the complex of external facts and our conceptions of them. This is, of course, distinctive of the Material view of Logic. We cannot pause to enter into any justification of such a view here, but shall postulate it for the present as being, if not philosophically unassailable, at any rate a perfectly tenable and consistent view for all purposes of science and therefore of logical inference.

It may serve to make our task plainer if we pause for a minute to consider what is the ideal towards which such a view or system of Logic tends; how would the world be represented to it if it had attained its ultimate state of perfection? If this state were attained every fact would be certain, that is potentially certain or capable of exact inference. The universe would be like a vast volume which happened to lie open before us at some page in the middle, but the leaves of which could readily be turned so as to enable us to consult and acquire with equal certainty the contents of any other page standing anywhere before or behind the one in question. Such a possible and accurate



determination of all facts, past, present, or future, would be a necessary consequence of a complete determination and mastery of all the data requisite, and of all the laws of sequence and coexistence by which they are connected together. A well known passage in Mill's *Logic* intimates that this is to be regarded as the ideal of that branch of Material Logic which he terms Sociology, and it need hardly be remarked that what holds good of animate nature would *a fortiori* hold good of the inanimate or physical world.

Now supposing that this ideal were attained would there be any further occasion for Hypotheses? or, to put it otherwise, would the word 'if' have any meaning or use? At first sight it might almost seem as if there would be no such meaning or use. If all that we wanted was merely to call up before the mind, and contemplate, the absent, whether past or future, and this in a concrete form, 'if' would really have no place in the scientific vocabulary of such a perfected system of scientific logic. The absent events which the mind would thus succeed in calling up at will out of the boundless sea of time and space might doubtless be less vivid than those which were present to its direct consciousness, but they need be none the less certainly apprehended. Why then should those who could thus get a sure and certain hold of any fact they wanted go out of their way by supposing or hypothesising a state of things other than that which exists? Confident anticipations might be made about the future, just as recollections or records might be entertained of the past, but on the view in question the former would be no more suitable ground than the latter for an 'if' to grow and flourish in.

The obvious reply is that, although this attainment of facts which are remote from us in time or in space is one part of science, it is very far indeed from being the whole. We have much more to do than to construct, in the concrete, the course of history past and future. We have to get at the abstract, to analyse, and become acquainted with the laws of things. This would be the case even though our predictive power were complete, for we cannot know the concrete in complicated cases without a considerable progress in analysis; but with our present imperfect attainments it becomes more obviously necessary.

There seem to be three main reasons why we have occasion to indulge in hypotheses. They are obvious enough when stated, but their definite enunciation will suggest certain cautions in their employment which are often neglected.

In the first place, they are used for what may be called *constructive* purposes. When thus employed they are simply, so to say, a sort of framework or scaffold, useful in the process

of erecting our edifice, but forming no integral part of it and therefore intended sooner or later to disappear. Our faculties being what they are, we can seldom succeed in tracing out remote consequences by direct deduction. Our only practicable course, when the problem is at all complicated, is to make assumptions or hypotheses, one after the other, and proceed to test them by experience. We make a variety of suppositions, ascertain, by experiment or reasoning, what would follow were they true, compare these consequences with the results which experience affords, and then reject and dismiss from the mind all those which have thus displayed their incorrectness.

Again, another use is simply *illustrative*, as when we employ hypotheses to familiarise ourselves or others with the bearing and the limits of any of the laws of nature. Such a use is a sort of fencing to which we have to resort in order to make ourselves thoroughly acquainted with the use of our weapons. These hypotheses, or problems as they are then generally called, are serviceable in accustoming us to every possible combination of events, so that we may be the better capable, when the time comes, to work out the consequences with which we shall be seriously concerned. The innumerable imaginary combinations which are introduced in problems in mathematics and the physical sciences have this purpose in view. In order to attain a clear comprehension of the bearing of a law or principle in the occasional and perhaps complicated combinations in which it is found in nature, we must work out the result which would follow from it in simpler imaginary examples.

The two above mentioned uses are by comparison speculative or scientific; with them may be contrasted the *practical* use. This latter arises out of the necessity of our being forewarned and forearmed against a great number of contingencies which may at one time or another come in our way. We find it useful to invent many imaginary combinations and to trace their consequences, because we cannot be sure but that some one or other of them may befall us. We are in fact simply making an approach to anticipating future experience. If we knew for certain in what form the experience would occur, we should only need to prepare ourselves for that particular form of it. The shape in which we pictured it to ourselves beforehand would then be called—not a hypothesis but—an anticipation. But this previous certainty is naturally in many cases unattainable. We can reach to nothing more than an alternative certainty; our knowledge being confined to the fact that some one or other of a given number of contingencies will occur, but which of them we cannot tell.

In reference to the first two of the above-mentioned employ-

ments, an important remark must be made. In each case alike, that change in what may be called the natural career of events, which is mentally introduced when we make the hypothesis, is arbitrary but perfectly determinate. We might rather say that it is determinate because it is arbitrary, a change which we introduce ourselves being in our own power to make it what we will. The framer of the hypothesis ought to be able to assign precisely the limits of the change which he contemplates, and to recognise that everything which he does not so change or which is not implicated in what he does so change, remains as it was and is left to develop itself according to its natural laws. Our hypothesis generally introduces some supposed definite alteration into the course of nature; an alteration consisting either in a variation of the laws which govern the events, or in the introduction of fresh events, or in the mutual collocations of existing events. Suppose, for instance, that we are discussing the consequences which would result from a variation in the velocity of rotation of the earth. We suppose the velocity, say, to be doubled, and then calculate the consequences;—that the shape of the earth itself might be altered, that the arrangement of land and water would be different, that changes of climate would thence ensue, and so on. Here, as we have said, the contemplated change is perfectly definite and assignable. We know exactly what we suppose to be altered, and how much, and assuming that the laws and collocations remain unaltered in other directions we trace the consequences of the proposed innovation. In physical science, at any rate, any haziness as to the precise limits of our hypothesis would never be tolerated.

Let us examine a case or two from the social and moral sciences, by way of illustration, beginning with Political Economy. Every one must have noticed how in this science the wildest suppositions are constantly made by sober writers: suppositions which no one would expect to see realised except in a world constructed out of a magnified Bedlam. Cases are put as to what would follow were all money abolished, were the amount in circulation instantly doubled, were all productive labourers to cease working for a given period, and so on without limit. Such hypotheses are perfectly admissible and often highly serviceable. Their function is explanatory. They are intended to explain the working of some general law, and for that purpose extreme instances will serve at least as well as any others, and often much better. They have too an important practical use within certain limits. Though Political Economy does not generally attempt to wander far from our present standing-point of time, it constantly does so to a short extent, especially into the immediate future. But owing to the great complication of

many of the data upon which it has to rely, it can seldom venture upon such a step without much hesitation and uncertainty. It can only make its assertions in the alternative or hypothetical form. If so and so is the case, then such results will follow; if so and so, then such other results, and so on.

Turn now to Ethics. Here again we have general laws, at least on most theories of Ethics, and therefore all the range of their application is valid for the purpose of illustration. We are at liberty to discuss the consequences, from a moral point of view, of putting our pauper population to death, just as we might discuss the economical consequences of such a step. And yet the example would strike most minds as being in some way unwarrantable. Why so? The difference between such a supposition and those welcomed in Political Economy cannot be rested upon any such reason as that one of them is possible or practicable and that the other is not. If we mean by possible that the events are so far within human control that did the desire exist it would be followed by performance, of course both enterprises are equally possible. If, on the other hand, we term our event impossible merely because we feel perfectly certain that as a matter of fact it never will occur, then both are equally impossible. The distinction is doubtless partly to be sought in the strongly practical nature of Ethics even on the most speculative treatment. It consists prominently of rules such as we are all concerned with more or less every day of our lives. The perpetration of a murder, even against the person of a tyrant, falls more within the practical sphere of the average agent than does an over-issue of paper money or a large diversion of fixed capital into circulating. We get therefore to interpret our rules by their practical aims, and therefore resent examples which make violent or unlikely suppositions when more moderate ones would at all answer the purpose.

The foregoing cases are simple enough; let us now turn to History. What we mean here by the term is not so much the Philosophy of History, or Sociology, as the more ordinary narrative history. The former consists in great part of general rules applied to the particular course of events under discussion. It is therefore for most intents and purposes a branch of Ethics; it may be regarded as a sort of applied Ethics on a large scale. But in the simplest narration, if the historian be at all given to reflection, we shall often find an 'if' introduced into the story in a way which makes one ask what it means. "No one can doubt that the Roman Republic would have subsided into a military despotism if Julius Cæsar had never lived; but is it at all clear that in that case Gaul would ever have formed a province of the Empire?" Such imaginary contingencies are not the amuse-

ment of the frivolous. On the contrary some of the thought-fullest and most practical of writers are as fond of them as any others. Mill says, in his essay *On Liberty*: "It is a bitter thought how different a thing the Christianity of the world might have been, if the Christian faith had been adopted as the religion of the empire under the auspices of Marcus Aurelius instead of those of Constantine".

Now is such a supposition as this a merely sportive exercise of the fancy, a sort of instantaneous romance, in fact, with no more practical or scientific aim than if a theologian were to set about guessing what might have happened had Adam been firmer in resisting temptation? Clearly there must be something to be gained either speculatively or practically by such an exercise of the inventive imagination. Some might express it by saying that the supposition of such a complete turn in the course of events is legitimate when the primary divergence contemplated is one that 'might have happened,' which was, to use the vulgar metaphor; 'on the cards'. This however fails to mark any philosophical distinction between the reasonable and unreasonable suppositions. In one sense, as already remarked, nothing could have happened otherwise than it did, for from unchanged antecedents the same consequences would always follow. And in another sense the events might have turned out other than they did, for in either case had the antecedents been changed so would the consequences.

I am disposed to think that we should find upon examination that the reasonable suppositions in such cases as these, as distinguished from the unreasonable and from those which are fanciful, fall mainly into two classes. One class of them are such as deal with the conduct of an individual only, or with a body of persons small enough to be likely to act in concert or be swayed by an individual will. We make our supposition about the behaviour of a king, a minister, or a parliament, rather than of any miscellaneous group. We ask, what if Luther had been less firm, if the Long Parliament had been more compliant, and so on; but not, what if such a nation or such a miscellaneous group of people had altered their course of action, or undergone a sudden change of sentiment. The other class of reasonable suppositions would be those which turn upon the use of some physical event which in conventional phrase 'might just as well have happened,' that is, which does not readily admit of being foreseen. The historian for instance would probably count it quite fair to speculate how European history would have been affected had a hurricane shattered the British fleet just before the battle of Trafalgar, or if Grouchy at Waterloo had been a little more rapid in his movements.

But what is the prerogative of such cases as these over others? That they can have nothing of what we have termed *constructive* value is obvious. When we indulge our fancy by framing such a hypothesis we are consciously stepping aside from the known course of events, we are postulating something which we are well aware did not happen; and we are doing this with no intention of becoming more certain as to what did happen. Nor can such suppositions claim to do much service in the way of *illustration*, at least not in any such sense as we have seen that they may help us in Political Economy. They are put in too concrete a form; they postulate too complicated a group of events for consideration. The consequences resulting from our supposition can never be more than guessed at, and unless they can be compared with the alternative and tested, there is no illustration gained by their employment.

The purpose they are really meant to subserve is, I apprehend, a *practical* one. It is quite compatible with this view that they are mostly found, not among future contingencies relevant to our own circumstances, but amongst those which are past and irrevocable, and often widely alien from anything likely to recur at the present day. For the study of history has with every one, to some extent, a prospective reference. Even if we do not consciously philosophise by generalising the laws whose working we are tracing, we are always on the look-out for precedents which have relevance to our own present and future needs. Consequences which turn upon the deeds of an individual, say the assassination of a ruler, are within the power of many other individuals. Those which turn upon the conduct of persons high in office are within the power of a sufficient number to give a certain practical value to the speculation.

It is not meant of course that these are the only circumstances under which the historian may put in an 'if'. But when he is dealing with occurrences so nearly unique, or so remote in some of their circumstances, that we can never expect to encounter anything similar to them, it appears to me that their interest must be rested on other than scientific grounds. It should rather be sought in that dramatic interest which induces us to fashion out a better life, more stirring incidents, or a more consistent career than that which truth compels us to accept. For a line or two the historian turns into the writer, or at least the suggester, of romance—a perfectly legitimate use of his powers but one which is æsthetic rather than scientific or practical.

But theologians also are sometimes given to meddling with suppositions. It appears to me that within their own department there is very little use in appealing to such a method, and indeed next to no meaning in their doing so. Take an instance

or two. In discussions upon Ethics, or in controversies upon the evidential value of miracles, we may sometimes fall in with hypotheses such as these:—What ought men to do in case the Deity were to command a wicked action? What should they believe were a miracle worked in support of some immoral doctrine? To a heathen such questions might not be intrinsically absurd. If there are plenty of gods who are mostly little better than men in their moral character, no one could undertake to say what sort of commands might not proceed from them, and it might be well therefore to be prepared for contingencies of the kind. But to any believer in a perfect Being such hypotheses are idle. It is as if one were to ask a geometer to work out some of the consequences of supposing the focus of an ellipse to change its relative position. He would not quite understand what we meant, and would remind us that any such hypothesis as this was self-contradictory; that we were in fact postulating by implication an entirely new kind of curve but retaining the old and now inappropriate name for it. Moral attributes of a Deity must upon almost any view be regarded as essential, and therefore capable of none but slight modification.

These considerations seem to apply to any kind of ideal, theological or ethical. Such ideals must always imply and be grounded upon a very complicated synthesis of intuitions, emotions and inductions. Now to conceive a serious alteration in any important group of these supports would by implication demand a reconsideration of the whole synthesis. What was supposed to be removed or changed would react on what was left (as it was thought) untouched; would disturb its balance, perhaps break up its cohesion, and thence bring about a profound alteration of the ideal itself. When speculations are indulged in as to what would follow were the popular belief in immortality to be changed or abandoned, it is not always remembered that there is a good deal more to be thought of than the *consequences* of such a change of belief. To suppose the change at all is in effect to presuppose a change in many other directions. It could only have come about by such a disturbance of the common foundations as would cause a very serious resettlement in other directions as well. In other words, if we please to put the hypothesis of a total change in some one moral or theological principle we ought in logical consistency to reconsider the question from a prior point of view, and try to ascertain what sort of concurrent changes we have tacitly supposed amongst those which are left.

It was pointed out that for any hypothesis to be admissible its precise limits must be determined, and if needful be stated. In Political Economy, for instance, it is easy, to an only slightly less extent than in physical science, to be thus precise. We are



dealing with men and their institutions in a somewhat abstract form, and when we postulate an alteration of motive or innovation in practice (as we always must do in such problems as those in question) we are able to conceive precisely the amount of change hypothetically contemplated, and to take good care that we do not thereby unconsciously introduce further changes which were not contemplated. But in Theology, in Ethics, in fact in any subject where man has to be regarded with the infinitely varied interaction of innumerable motives, such precision is altogether unattainable.

In their familiar form such hypotheses are often merely an indirect way of urging a recommendation. "If only the clergy would abandon their disputes and unite to oppose immorality and irreligion, what a mighty effect might they produce!" True, but why not say at once: "If the immoral and irreligious themselves changed their practice and their views?" Then we should have the end without needing to trouble ourselves about securing one particular means towards it. What is really meant is to address a bit of exhortation, and it is thought more hopeful to address it to a limited body, by reminding them of their influence for good or evil, than by letting it waste its force by a too indiscriminate application. In strictness our hypothesis is idle. We could not really suppose a change of sentiment affecting some thousands of persons (the clergy in question) without some sort of supposition as to how it could have come about. We should then perceive that we had had to assume a change of training and of thought in their case, and of feeling and judgment in those about them, which carried along with it by implication a good deal of that resultant change which was supposed to be circuitously effected through their agency.

There is another way in which hypotheses enter into ethical inquiries, which deserves notice, as it not unfrequently confounds together two very different classes of cases. The attempt is often made to deter any one from performing some particular action, or at least to demonstrate its pernicious character, by exhibiting the action on a large scale. "Only see," it is said, "what would follow, if all men or a great many, were to do so." I propose to pluck a bunch of grapes in a field through which I pass, and urge in defence that the owner will never miss that one. "Quite true," it is often replied, "but only see what would come of it if every one did the same, the owner would be ruined by the year's end." There is nothing wrong in this mode of illustration if no more is meant by it than to exhibit on a large scale what might fail to secure attention on a small scale. The consequences may be thus forced home upon an obtuse and selfish mind. But nothing is proved; nothing is shown which an acute and im-

partial mind might not equally have seen without the help of any supposition. It is as if I wished to prove that even a glass of water taken from a pond would lower the level of the surface. Some one, say, is tempted to doubt the fact. But he must admit that the deduction of a few hogsheads would produce a perceptible result, and can persuade himself therefore that a similar though very small effect would result even from the loss of a glassful.

But it is surely inconsistent to admit that in the individual case the good of the action outweighs the evil, and yet to claim that on the large scale these consequences are reversed. Magnify the good and the evil to any extent we please, but their proportions to one another will not be altered if they are magnified equally. Mr. Austin, for instance, argues thus:—"If I evade the payment of a tax imposed by a good Government, the *specific* effects of the mischievous forbearance are indisputably useful. For the money which I unduly withhold is convenient to myself, and compared with the bulk of the public revenue is a quantity too small to be missed. But the regular payment of taxes is necessary to the existence of the Government. And I, and the rest of the community, enjoy the security which it gives, because the payment of taxes is rarely evaded."

If we judge by consequences only I do not think that this line of reasoning would keep me from smuggling. It is not easy to see how a series of actions each of which is to yield a result of positive good are somehow to add up into a total which is negative. It is assumed, say, that by keeping £10 to myself, the balance of happiness is increased, since the consequent increase of comfort to myself by its detention is greater than the consequent diminution to the community by its expenditure for them. But this plea of the first defrauder is equally open to the second and to those who come after him. If the taxes of a thousand persons are lost, just one thousand persons are rendered happier by having the money to spend as they please. Would it not be sounder to argue thus—"By defrauding the revenue of £10 you *do* injure the community; you cause more injury to others than you cause happiness to yourself". The surface of happiness, so to say, which you want to skim from the rest of society and to put into your own cup, is thin, no doubt, but it is very broad, and it makes up in area what it loses in depth. You cannot gain in this way without others losing, whether they know it or not.

There is another class of cases, a reference to which will show us how very misleading a test is furnished by an examination of the consequences of such a hypothetical extension of the action upon a large scale. A father, say, is proposing to train his son

to enter the ministry. A friend seeks to dissuade him upon the plea that if all took this line it would be highly injurious, that production would come to a complete standstill, and so on. What would his reply be? Naturally he replies that his conduct must be judged separately; that if too many adopt the particular course in question, he for one will cease to do so. But if actions are to be judged by their consequences only, there is little or no formal difference between the line of argument adopted in this case and in those previously under discussion. The fact is that though something may be *illustrated*, nothing can really be *proved* by framing and contemplating the supposition of similar actions upon a large scale. If performance upon a small scale has mischievous consequences, performance upon a large scale will almost necessarily have consequences still more mischievous and therefore more obvious. But we cannot convert this line of reasoning and argue that, because identity of action by a multitude is disastrous, that therefore the same action when performed by the individual must be forbidden as pernicious.

The same remarks apply to many important affairs in life. Suppose I had been an African merchant engaged in the slave trade: suppose moreover that the test of actions is to be sought in their consequences only, neglecting all the potent indirect influences which depend upon sympathy with a good cause, and with the struggle towards an ideal. I take my stand upon this ground:—I quite admit that the slave trade is a grievous injury to the human race. I have no objection to its total suppression, in fact I would readily aid in procuring this suppression. But, so long as the trade is permitted, the fact of my carrying on the business does no direct harm to any one, at least in the way in question. I do not even really add to the total number of slaves imported, for, by the well known laws of supply and demand, if the number of traders in any direction is artificially diminished profits will rise, and others be attracted into the business. To make any rational appeal to a man upon the consequences of his actions, we must try to convince him, not by pointing out what would happen if something else were to come about, but by showing him what *will* result from his conduct. We may appeal to his self-interest by maintaining that it is the worse for him to transgress any law divine or human, or to blunt his conscience, or we may appeal to his sympathetic feelings by showing that every one who triumphs over the love of gain is a help to humanity and may do good by his example. These are rational appeals, but they do not involve any imaginary hypothesis.

Hypotheses are constantly implied even where they are not explicitly stated. This is the case when judgment is passed

upon the conduct of an individual or body of persons. On any theory of ethics, to blame an agent must imply that we contrast the conduct he really did pursue with other conduct which he might have pursued. When we say that he did wrong, the same idea may be conveyed by saying, had he done so and so instead he would have done right, or at least have done better. And when the consequences of his conduct are the only element taken into account, we may translate our condemnation into the terms—"If so and so had been done instead, then the consequences would have been certainly or probably better." That is, we are ready on demand with some hypothetical line of conduct different from the actual. But here comes in the difficulty already mentioned. To make the comparison a sound one we ought to contrast his own actual conduct with some hypothetical alternative which is equally limited in its application to his individual case. Nothing is proved by contrasting what he did with that which some *class* to which he is referred, perhaps rather arbitrarily, might have done.

Examples need not be multiplied; but I think that any one who contemplates Political Economy ethically, that is who tries to deduce rules good for the individual agent from the general conclusions of that science will find plenty of illustrations of what has just been advanced. Conduct is sometimes good (or bad) alike when done by the many or by the few. This is the ground mainly occupied by Ethics, though it is but a portion of human conduct, and therefore corresponds to a portion only of the general art of adding to human happiness. Sometimes, again, conduct is bad when pursued by the many, but good for the few. This is often the case in Political Economy, and is connected with the advocacy of the *laissez faire* principle, and with the great practical difficulty which is so often felt when we try to guide ourselves ethically by the conclusions of economists. Sometimes, again, the result is good if all without exception combine, either by consent or under compulsion, to do the same; but the infringement by but a very few will destroy all good result as effectually as a general permission. In such cases the economist is driven to appeal to the State for aid.

In the last case we are led to the apparently paradoxical conclusion that it is logically consistent, when consequences are the test, to blame a body of persons collectively, but to absolve them each individually. This is the case when we see that the whole body, by combining, might abolish some injurious practice. We then compare what that body does do with what it might do, and blame it accordingly. But till the members do combine we cannot say the same to them individually. When we picture what would follow did a few abstain, we see not merely an

insignificant gain, but no gain at all ; for what they leave undone others will certainly make up.

When therefore we test the character of an action by its hypothetical generalisation, that is by seeing what would follow were it performed by many or by all, the test becomes very untrustworthy, for the cases to which we may have to apply it are widely distinct.

Those who are familiar with the science of Ethics will of course have noticed already that we have touched incidentally upon some of Kant's doctrines. He repeatedly lays down, as a test to the individual agent of the rightness of his conduct—Can you will the maxim according to which you act to be a law universal to mankind ? There seems to be more than one objection to the validity of such a test. For one thing it assumes that there is but one maxim, or but one that is thoroughly appropriate, to which the action is to be referred, for it speaks of *the* maxim according to which we act ; whereas any particular action will always admit of reference to an indefinite number of maxims according to the degree of particularity with which we specify the characteristics of the action. But passing this over, the question, What would follow if all men were to do as I do ? can surely never lead to an answer which will give a certain test of the goodness or otherwise of the action. If the test is to be at all serviceable it must mean that the *consequences* of the act would be bad when we suppose it thus generalised, for to confine it to those cases in which the action, so generalised, would not merely involve bad results but become self-inconsistent or downright absurd, would be to limit its applicability to a very small portion indeed of the field of Ethics as commonly understood. But, as above remarked, this way of looking at the matter confounds several widely different cases. Sometimes it serves to illustrate on the large scale consequences which should really be visible also on the small scale ; but then the action here must really admit of examination by itself. But often when the action would be pernicious on the large scale, the agent is at liberty to reply : " I do in part because all others *do not*, and I should begin to change my practice if I saw them begin to imitate generally my example". And finally, when the general consequences would be beneficial, he may sometimes say : "Yes, I know it would be better if we all combined for the purpose, but till I see some signs of such a combination there is no need for me just to sacrifice myself for a formula".

J. VENN.

#### IV.—ON THE NATURE OF THINGS-IN-THEMSELVES.

##### *Meaning of the Individual Object.*

My feelings arrange and order themselves in two distinct ways. There is the internal or subjective order, in which sorrow succeeds the hearing of bad news, or the abstraction "dog" symbolises the perception of many different dogs. And there is the external or objective order, in which the sensation of letting go is followed by the sight of a falling object and the sound of its fall. The objective order, *quâ* order, is treated by physical science, which investigates the uniform relations of *objects* in time and space. Here the word *object* (or *phenomenon*) is taken merely to mean a group of my feelings, which persists as a group in a certain manner; for I am at present considering only the objective order of my feelings. The object, then, is a set of changes *in* my consciousness, and not anything out of it. Here is as yet no metaphysical doctrine, but only a fixing of the meaning of a word. We may subsequently find reason to infer that there is something which is not object, but which corresponds in a certain way with the object; this will be a metaphysical doctrine, and neither it nor its denial is involved in the present determination of meaning. But the determination must be taken as extending to all those inferences which are made by science in the objective order. If I hold that there is hydrogen in the sun, I mean that if I could get some of it in a bottle, and explode it with half its volume of oxygen, I should get that group of possible sensations which we call "water". The inferences of physical science are all inferences of my real or possible feelings; inferences of something actually or potentially in my consciousness, not of anything outside it.

##### *Distinction of Object and Eject.*

There are, however, some inferences which are profoundly different from those of physical science. When I come to the conclusion that *you* are conscious, and that there are objects in your consciousness similar to those in mine, I am not inferring any actual or possible feelings of my own, but *your* feelings, which are not, and cannot by any possibility become, objects in my consciousness. The complicated processes of your body and the motions of your brain and nervous system, inferred from evidence of anatomical researches, are all inferred as things possibly visible to me. However remote the inference of physical science, the thing inferred is always a part of me, a possible set of changes in my consciousness bound up in the objective

order with other known changes. But the inferred existence of your feelings, of objective groupings among them similar to those among my feelings, and of a subjective order in many respects analogous to my own,—these inferred existences are in the very act of inference *thrown out* of my consciousness, recognised as outside of it, as *not* being a part of me. I propose, accordingly, to call these inferred existences *ejects*, things thrown out of my consciousness, to distinguish them from *objects*, things presented in my consciousness, phenomena. It is to be noticed that there is a set of changes of my consciousness symbolic of the eject, which may be called my conception of you; it is (I think) a rough picture of the whole aggregate of my consciousness, under imagined circumstances like yours; *quid* group of my feelings, this conception is like the object in substance and constitution, but differs from it in implying the existence of something that is not itself, but corresponds to it, namely, of the eject. The existence of the object, whether perceived or inferred, carries with it a group of beliefs; these are always beliefs in the future sequence of certain of my feelings. The existence of this table, for example, as an object in my consciousness, carries with it the belief that if I climb up on it I shall be able to walk about on it as if it were the ground. But the existence of my conception of you in my consciousness carries with it a belief in the existence of you outside of my consciousness, a belief which can never be expressed in terms of the future sequence of my feelings. How this inference is justified, how consciousness can testify to the existence of anything outside of itself, I do not pretend to say; I need not untie a knot which the world has cut for me long ago. It may very well be that I myself am the only existence, but it is simply ridiculous to suppose that anybody else is. The position of absolute idealism may, therefore, be left out of count, although each individual may be unable to justify his dissent from it.

#### *Formation of the Social Object.*

The belief, however, in the existence of other men's consciousness, in the existence of ejects, dominates every thought and every action of our lives. In the first place, it profoundly modifies the object. This room, the table, the chairs, your bodies, are all objects in my consciousness; as simple objects, they are parts of me. But I, somehow, infer the existence of similar objects in your consciousness, and these are not objects to me, nor can they ever be made so; they are ejects. This being so, I bind up with each object as it exists in my mind the thought of similar objects existing in other men's minds; and I thus form the complex conception, "this table, as an object in



the minds of men,"—or, as Mr. Shadworth Hodgson puts it, an object of consciousness in general. This conception symbolises an indefinite number of ejects, together with one object which the conception of each eject more or less resembles. Its character is therefore mainly ejective in respect of what it symbolises, but mainly objective in respect of its nature. I shall call this complex conception the *social object*; it is a symbol of one thing (the *individual object*, it may be called for distinction's sake) which is in my consciousness, and of an indefinite number of other things which are ejects and out of my consciousness. Now, it is probable that the individual object, as such, never exists in the mind of man. For there is every reason to believe that we were gregarious animals before we became men properly so called. And a belief in the eject—some sort of recognition of a kindred consciousness in one's fellow-beings—is clearly a condition of gregarious action among animals so highly developed as to be called conscious at all. Language, even in its first beginnings, is impossible without that belief; and any sound which, becoming a sign to my neighbour, becomes thereby a mark to myself, must by the nature of the case be a mark of the social object, and not of the individual object. But if not only this conception of the particular social object, but all those that have been built up out of it, have been formed at the same time with, and under the influence of, language, it seems to follow that the belief in the existence of other men's minds like our own, but not part of us, must be inseparably associated with every process whereby discrete impressions are built together into an object. I do not, of course, mean that it presents itself in consciousness as distinct; but I mean that as an object is formed in my mind, a fixed habit causes it to be formed as social object, and insensibly embodies in it a reference to the minds of other men. And this sub-conscious reference to supposed ejects is what constitutes the impression of *externality* in the object, whereby it is described as *not-me*. At any rate, the formation of the social object supplies an account of this impression of outness, without requiring me to assume any ejects or things outside my consciousness except the minds of other men. Consequently, it cannot be argued from the impression of outness that there is anything outside of my consciousness except the minds of other men. I shall argue presently that we have grounds for believing in non-personal ejects, but these grounds are not in any way dependent on the impression of outness, and they are not included in the ordinary or common-sense view of things. It seems to me that the prevailing belief of uninstructed people is merely a belief in the social object, and not in a non-personal

eject, somehow corresponding to it; and that the question "Whether the latter exists or not?" is one which cannot be put to them so as to convey any meaning without considerable preliminary training. On this point I agree entirely with Berkeley, and not with Mr. Spencer.

*Difference between Mind and Body.*

I do not pause to show how belief in the Eject underlies the whole of natural ethic, whose first great commandment, evolved in the light of day by healthy processes wherever men have lived together, is, "Put yourself in his place". It is more to my present purpose to point out what is the true difference between body and mind. Your body is an object in my consciousness; your mind is not, and never can be. Being an object, your body follows the laws of physical science, which deals with the objective order of my feelings. That its chemistry is ordinary chemistry, its physics ordinary physics, its mechanics ordinary mechanics, may or may not be true; the circumstances are exceptional, and it is conceivable (to persons ignorant of the facts) that allowance may have to be made for them, even in the expression of the most general laws of nature. But in any case, every question about your body is a question about the physical laws of matter, and about nothing else. To say: "Up to this point science can explain; here the soul steps in," is not to say what is untrue, but to talk nonsense. If evidence were found that the matter constituting the brain behaved otherwise than ordinary matter, or if it were impossible to describe vital actions as particular examples of general physical rules, this would be a fact in physics, a fact relating to the motion of matter; and it must either be explained by further elaboration of physical science, or else our conception of the objective order of our feelings would have to be changed. The question, "Is the mind a force?" is condemned by similar considerations. A certain variable quality of matter (the rate of change of its motion) is found to be invariably connected with the position relatively to it of other matter; considered as expressed in terms of this position, the quality is called Force. Force is thus an abstraction relating to *objective* facts; it is a mode of grouping of my feelings, and cannot possibly be the same thing as an eject, another man's consciousness. But the question: "Do the changes in a man's consciousness *run parallel* with the changes of motion, and therefore with the forces in his brain?" is a real question, and not *prima facie* nonsense. Objections of like character may be raised against the language of some writers, who speak of changes in consciousness as *caused* by actions on the organism. The word *Cause*, *πολλὰχῶς λεγόμενον* and misleading

as it is, having no legitimate place in science or philosophy, may yet be of some use in conversation or literature, if it is kept to denote a relation between objective facts, to describe certain parts of the phenomenal order. But only confusion can arise if it is used to express the relation between certain objective facts in my consciousness, and the ejective facts which are inferred as corresponding in some way to them and running parallel with them. For all that we know at present, this relation does not in any way resemble that expressed by the word Cause.

To sum up, the distinction between eject and object, properly grasped, forbids us to regard the eject, another man's mind, as coming into the world of objects in any way, or as standing in the relation of cause or effect to any changes in that world. I need hardly add that the facts do very strongly lead us to regard our bodies as merely complicated examples of practically universal physical rules, and their motions as determined in the same way as those of the sun and the sea. There is no evidence which amounts to a *prima facie* case against the dynamical uniformity of Nature; and I make no exception in favour of that *stykick* force which fills existing lunatic asylums and makes private houses into new ones.

#### *Correspondence of Elements of Mind and Brain-Action.*

I have already spoken of certain ejective facts—the changes in your consciousness—as running parallel with the changes in your brain, which are objective facts. The parallelism here meant is a parallelism of complexity, an analogy of structure. A spoken sentence and the same sentence written are two utterly unlike things, but each of them consists of elements; the spoken sentence of the elementary sounds of the language, the written sentence of its alphabet. Now the relation between the spoken sentence and its elements is very nearly the same as the relation between the written sentence and its elements. There is a correspondence of element to element; although an elementary sound is quite a different thing from a letter of the alphabet, yet each elementary sound belongs to a certain letter or letters. And the sounds being built up together to form a spoken sentence, the letters are built up together, *in nearly the same way*, to form the written sentence. The two complex products are as wholly unlike as the elements are, but the manner of their complication is the same. Or, as we should say in the mathematics, a sentence spoken is the same function of the elementary sounds as the same sentence written is of the corresponding letters.

Of such a nature is the correspondence or parallelism between

mind and body. The fundamental "deliverance" of consciousness affirms its own complexity. It seems to me impossible, as I am at present constituted, to have only one absolutely simple feeling at a time. Not only are my objective perceptions, as of a man's head or a candlestick, formed of a great number of parts ordered in a definite manner, but they are invariably accompanied by an endless string of memories, all equally complex. And those massive organic feelings with which, from their apparent want of connection with the objective order, the notion of consciousness has been chiefly associated,—those also turn out, when attention is directed to them, to be complex things. In reading over a former page of my manuscript, for instance, I found suddenly, on reflection, that although I had been conscious of what I was reading, I paid no attention to it; but had been mainly occupied in debating whether faint red lines would not be better than blue ones to write upon, in picturing the scene in the shop when I should ask for such lines to be ruled, and in reflecting on the lamentable helplessness of nine men out of ten when you ask them to do anything slightly different from what they have been accustomed to do. This debate had been started by the observation that my handwriting varied in size according to the nature of the argument, being larger when that was diffuse and explanatory, occupied with a supposed audience; and smaller when it was close, occupied only with the sequence of propositions. Along with these trains of thought went the sensation of noises made by poultry, dogs, children, and organ-grinders; and that vague diffused feeling in the side of the face and head which means a probable toothache in an hour or two. Under these circumstances, it seems to me that consciousness must be described as a succession of groups of changes, as analogous to a rope made of a great number of occasionally interlacing strands.

This being so, it will be said that there is a unity in all this complexity, that in all these varied feelings it is I who am conscious, and that this sense of personality, the self-perception of the Ego, is one and indivisible. It seems to me (here agreeing with Hume) that the "unity of apperception" does not exist in the instantaneous consciousness which it unites, but only in subsequent reflection upon it; and that it consists in the power of establishing a certain connection between the memories of any two feelings which we had at the same instant. A feeling, at the instant when it exists, exists *an und für sich*, and not as *my* feeling; but when on reflection I remember it as my feeling, there comes up not merely a faint repetition of the feeling, but inextricably connected with it a whole set of connections with the general stream of my consciousness. This memory, again, *quid* memory, is relative to the past feeling which it partially recalls; but in

so far as it is itself a feeling, it is absolute, *Ding-an-sich*. The feeling of personality, then, is a certain feeling of connection between faint images of past feelings; and personality itself is the fact that such connections are set up, the property of the stream of feelings that part of it consists of links binding together faint reproductions of previous parts. It is thus a relative thing, a mode of complication of certain elements, and a property of the complex so produced. This complex is consciousness. When a stream of feelings is so compacted together that at each instant it consists of (1) new feelings, (2) fainter repetitions of previous ones, and (3) links connecting these repetitions, the stream is called a consciousness. A far more complicated grouping than is necessarily implied here is established when discrete impressions are run together into the perception of an object. The *conception* of a particular object, as object, is a group of feelings, symbolic of many different perceptions, and of links between them and other feelings. The distinction between Subject and Object is twofold; first, the distinction with which we started between the subjective and objective *orders* which simultaneously exist in my feelings; and secondly, the distinction between me and the social object, which involves the distinction between me and you. Either of these distinctions is exceedingly complex and abstract, involving a highly organised experience. It is not, I think, possible to separate one from the other; for it is just the objective order which I do suppose to be common to me and to other minds.

I need not set down here the evidence which shows that the complexity of consciousness is paralleled by complexity of action in the brain. It is only necessary to point out what appears to me to be a consequence of the discoveries of Müller and Helmholtz in regard to sensation: that at least those distinct feelings which can be remembered and examined by reflection are paralleled by changes in a portion of the brain only. In the case of sight, for example, there is a message taken from things outside to the retina, and therefrom sent in somewhither by the optic nerve; now we can tap this telegraph at any point and produce the sensation of sight, without any impression on the retina. It seems to follow that what is known *directly* is what takes place at the inner end of this nerve, or that the consciousness of sight is simultaneous and parallel in complexity with the changes in the grey matter at the internal extremity, and not with the changes in the nerve itself, or in the retina. So also a pain in a particular part of the body may be mimicked by neuralgia due to lesion of another part.

We come, finally, to say then that as your consciousness is made up of elementary feelings grouped together in various ways

(ejective facts), so a part of the action in your brain is made up of more elementary actions in parts of it, grouped together *in the same ways* (objective facts). The knowledge of this correspondence is a help to the analysis of both sets of facts; but it teaches us in particular that any feeling, however apparently simple, which can be retained and examined by reflection, is already itself a most complex structure. We may, however, conclude that this correspondence extends to the elements, and that each simple feeling corresponds to a special comparatively simple change of nerve-matter.

*The Elementary Feeling is a Thing-in-itself.*

The conclusion that elementary feeling co-exists with elementary brain-motion in the same way as consciousness co-exists with complex brain-motion, involves more important consequences than might at first sight appear. We have regarded consciousness as a complex of feelings, and explained the fact that the complex is conscious, as depending on the mode of complication. But does not the elementary feeling itself imply a consciousness in which alone it can exist, and of which it is a modification? Can a feeling exist by itself, without forming part of a consciousness? I shall say *no* to the first question, and *yes* to the second, and it seems to me that these answers are required by the doctrine of evolution. For if that doctrine be true, we shall have along the line of the human pedigree a series of imperceptible steps connecting inorganic matter with ourselves. To the later members of that series we must undoubtedly ascribe consciousness, although it must, of course, have been simpler than our own. But where are we to stop? In the case of organisms of a certain complexity, consciousness is inferred. As we go back along the line, the complexity of the organism and of its nerve-action insensibly diminishes; and for the first part of our course, we see reason to think that the complexity of consciousness insensibly diminishes also. But if we make a jump, say to the tunicate molluscs, we see no reason there to infer the existence of consciousness at all. Yet not only is it impossible to point out a place where any sudden break takes place, but it is contrary to all the natural training of our minds to suppose a breach of continuity so great. All this imagined line of organisms is a series of objects in my consciousness; they form an insensible gradation, and yet there is a certain unknown point at which I am at liberty to infer facts *out* of my consciousness corresponding to them! There is only one way out of the difficulty, and to that we are driven. Consciousness is a complex of ejective facts,—of elementary feelings, or rather of those remoter elements which cannot even be felt,

but of which the simplest feeling is built up. Such elementary ejective facts go along with the action of every organism, however simple; but it is only when the material organism has reached a certain complexity of nervous structure (not now to be specified) that the complex of ejective facts reaches that mode of complication which is called Consciousness. But as the line of ascent is unbroken, and must end at last in inorganic matter, we have no choice but to admit that every motion of matter is simultaneous with some ejective fact or event which might be part of a consciousness. From this follow two important corollaries.

1. A feeling can exist by itself, without forming part of a consciousness. It does not depend for its existence on the consciousness of which it may form a part. Hence a feeling (or an eject-element) is *Ding-an-sich*, an absolute, whose existence is not relative to anything else. *Sentitur* is all that can be said.

2. These eject-elements, which correspond to motions of matter, are connected together in their sequence and co-existence by counterparts of the physical laws of matter. For otherwise the correspondence could not be kept up.

*Mind-stuff is the reality which we perceive as Matter.*

That element of which, as we have seen, even the simplest feeling is a complex, I shall call *Mind-stuff*. A moving molecule of inorganic matter does not possess mind, or consciousness; but it possesses a small piece of mind-stuff. When molecules are so combined together as to form the film on the under side of a jelly-fish, the elements of mind-stuff which go along with them are so combined as to form the faint beginnings of Sentience. When the molecules are so combined as to form the brain and nervous system of a vertebrate, the corresponding elements of mind-stuff are so combined as to form some kind of consciousness; that is to say, changes in the complex which take place at the same time get so linked together that the repetition of one implies the repetition of the other. When matter takes the complex form of a living human brain, the corresponding mind-stuff takes the form of a human consciousness, having intelligence and volition.

Suppose that I see a man looking at a candlestick. Both of these are objects, or phenomena, in my mind. An *image* of the candlestick, in the optical sense, is formed upon his retina, and nerve messages go from all parts of this to form what we may call a *cerebral image* somewhere in the neighbourhood of the optic thalami in the inside of his brain. This cerebral image is a certain complex of disturbances in the matter of these organs; it is a material or physical fact, therefore a



group of my possible sensations, just as the candlestick is. The cerebral image is an imperfect representation of the candlestick, corresponding to it point for point in a certain way. Both the candlestick and the cerebral image are matter; but one material complex *represents* the other material complex in an imperfect way.

Now the candlestick is not the external reality whose existence is represented in the man's mind; for the candlestick is a mere perception in *my* mind. Nor is the cerebral image the man's perception of the candlestick; for the cerebral image is merely an idea of a possible perception in my mind. But there *is* a perception in the man's mind, which we may call the *mental image*; and this corresponds to some external reality. *The external reality bears the same relation to the mental image that the (phenomenal) candlestick bears to the cerebral image.* Now the candlestick and the cerebral image are both matter; they are made of the same stuff. Therefore the external reality is made of the same stuff as the man's perception or mental image, that is, it is made of mind-stuff. And as the cerebral image represents imperfectly the candlestick, in the same way and to the same extent the mental image represents the reality external to his consciousness. Thus in order to find the thing-in-itself which is represented by any object in my consciousness, such as a candlestick, I have to solve this question in proportion, or rule of three:—

*As the physical configuration of my cerebral image of the object*  
*is to the physical configuration of the object,*  
*so is my perception of the object (the object regarded as*  
*complex of my feelings)*  
*to the thing-in-itself.*

Hence we are obliged to identify the thing-in-itself with that complex of elementary mind-stuff which on other grounds we have seen reason to think of as going along with the material object. Or, to say the same thing in other words, the reality external to our minds which is represented in our minds as matter, is in itself mind-stuff.

The universe, then, consists entirely of mind-stuff. Some of this is woven into the complex form of human minds, containing imperfect representations of the mind-stuff outside them, and of themselves also, as a mirror reflects its own image in another mirror, *ad infinitum*. Such an imperfect representation is called a material universe. It is a picture in a man's mind of the real universe of mind-stuff.

The two chief points of this doctrine may be thus summed up:—

Matter is a mental picture in which mind-stuff is the thing represented.

Reason, intelligence, and volition are properties of a complex which is made up of elements themselves not rational, not intelligent, not conscious.

W. K. CLIFFORD.

NOTE.—The doctrine here expounded appears to have been arrived at independently by many persons; as was natural, seeing that it is (or seems to me) a necessary consequence of recent advances in the theory of perception. Kant threw out a suggestion that the *Ding-an-sich* might be of the nature of mind; but the first statement of the doctrine in its true connection that I know of, is by Wundt. Since it dawned on me, some time ago, I have supposed myself to find it more or less plainly hinted in many writings; but the question is one in which it is peculiarly difficult to make out precisely what another man means, and even what one means one's self.

Some writers (e.g., Dr. Tyndall) have used the word *matter* to mean the phenomenon *plus* the reality represented; and there are many reasons in favour of such usage in general. But for the purposes of the present discussion I have thought it clearer to use the word for the phenomenon as distinguished from the thing-in-itself.

W. K. C.

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## V.—THE PHILOSOPHY OF ETHICS.

ETHICS is a subject which has suffered a somewhat singular fate: for whereas on its practical side there has been a more perfect agreement about it than about any other important branch of human knowledge, on its speculative side it has been, and it still is, the centre of apparently endless controversy—the subject of every species of confusion. In the course of the following remarks, which, though they must add to the controversy, will not, I hope, add to the confusion, I have attempted a treatment of the second or speculative side. I have not tried either to attack any old system, or to enunciate a new one. My sole aim has been to lay down the general lines to which *any* legitimate system must conform, and to point out as precisely as possible the relation which Ethics bears to other subjects of inquiry, and the kind of proof of which its propositions are susceptible. In doing so I have been compelled to begin with some general observations which may seem of disproportionate length when compared with the more strictly ethical part of the inquiry, but which cannot be omitted without in some degree prejudicing the clearness of what is to follow.

## I.

Everything that we know, or think we know, may be classed under one of four heads, which, without departing very widely from ordinary usage, may be named thus: Science, Ontology, Ethics, and Philosophy. By Science is meant here, not only what commonly goes by that name, but also history, and knowledge of particular matters of fact: so that "knowledge of phenomena and the relations subsisting between phenomena" would be a more accurate, though less convenient, expression for what is intended. In Ontology is included not only Theology and all doctrines of the Absolute, but also (and this is not necessarily the same thing) all real or supposed knowledge of entities which are not phenomenal.

What is meant by Ethics will be shown in detail later on. Here it is only necessary to say that it includes not only what are commonly called moral systems, but also some analogous systems not usually so described.

Multitudes of propositions, all professing to embody knowledge belonging to one of these departments, are being continually put forward for our acceptance. And as no one believes all of them, so those who profess to act rationally must hold that there are grounds for rejecting the propositions they disbelieve, and for accepting those they believe. The systematic account of these grounds of belief and disbelief makes up the fourth of the classes into which possible knowledge is divided, and is here always called Philosophy.

If it be objected that this is not the common meaning of the term, I reply that it would be difficult to point out what the common meaning is. It has been used, perhaps most frequently in England, as being equivalent to Psychology, which is a department of science. But researches after the absolute are also called philosophical, and these belong to Ontology. Ethics is sometimes called moral philosophy, as science is sometimes called natural philosophy; while Logic, which a very common usage regards as a branch of philosophy, would, as I shall presently explain, be included in it also by my definition. So that there cannot, on the whole, be much harm in using the term to represent a definite subject of investigation for which there is no other word. In this sense it is not very different from what Kant called Critical Philosophy.

It follows directly from this definition that, however restricted the range of possible knowledge may be, philosophy can never be excluded from it. For unless the restriction be purely arbitrary, there must be reasons for it; and it is the systematic account of these reasons which is here called Philosophy. So

that even if it should turn out that Metaphysics is an illusion, and only "positive" knowledge is attainable, this discovery would be so far from destroying philosophy that it is only in philosophy that it could be established.

If mankind was in the condition of believing *nothing* and, without a bias in any particular direction, was merely on the look-out for some legitimate creed, it would not, I conceive, be possible, *à priori*, to name any of the positive characteristics which the philosophy corresponding to that creed must necessarily possess. But since this is by no means the case, since everybody has a certain number of scientific beliefs, and most people have a certain number of ethical and ontological (theological) ones, it may be possible to describe some of the attributes which should be found in a philosophy professing to support these provisional conclusions.

For example, since no one supposes that all the propositions we believe are self-evident, it may be assumed that the greater number of them are legitimate inferences from propositions which *are* self-evident. And from this it follows that philosophy must consist of two main departments, one of which deals with these ultimate or self-evident propositions, the other with modes of inference.

I do not forget that some writers have held that the truth of a system is to be inferred, not from any self-evident propositions lying at its root, but from the consistency and coherence of its parts, though each of these taken by itself is by no means self-evident. Of such a system it would apparently be incorrect to say that one part is ultimate, and another derivative; it ought rather to be said that the truth of the whole is an inference from the consistency of the parts, and the truth of the parts is an inference from the truth of the whole. But even on this theory the formula above stated holds good, for such systems so far from being self-contained (as it were), and sufficient evidence for themselves, are really, as a little consideration will show, dependent for their validity on some such proposition as this—"all that is coherent is true". Which is itself again either ultimate or derivative.

This double function is an important characteristic of a complete philosophy; let me now mention another which, though it would seem sufficiently obvious, is continually ignored. It may be stated thus: "The business of philosophy is to deal with the grounds, not the causes of belief".

There is no distinction which has to be kept more steadily in view than this between the causes or antecedents which produce a belief, and the grounds or reasons which justify one. The inquiry into the first is psychological, the inquiry into the second

is philosophical, and they belong therefore (according to the classification just announced), to entirely distinct departments of knowledge.

No doubt, in constructing a philosophy, a previous psychological inquiry may be required. It may be necessary to acquaint ourselves with the various modes by which we arrive at conviction, before we can select those which are legitimate. But what we must not do, and what we are very apt to do, is to suppose that by performing the first operation satisfactorily, we absolve ourselves from performing the second at all. In the face of modern discovery we have continually to recollect that no progress made in tracing the history of opinions, no development of the theory of association of ideas, no application of the doctrine of evolution to mind, however much they may prepare the ground for a philosophy, add, or can add, one fragment to its structure.

Thus, it is never a final answer to philosophy to say of a particular belief, it is "innate," "connate," "empirical," or "*à priori*," the result of inheritance, or the product of the association of ideas. Psychology is satisfied by such replies, but to make psychology the rational foundation for philosophy is to make a department of science support that on which all science is by definition supposed to rest. It is strictly impossible that any solution of the question "How came I to believe this?" should completely satisfy the demand "Why ought I to believe it?" though, especially in the case of derivative beliefs, it may go some way towards it. In the case of what profess to be ultimate beliefs, discussions as to their origin are either philosophically irrelevant, or else prove to demonstration that they are not ultimate. This will perhaps be clearer if we take a concrete case. Let us suppose that the result of a particular psychological investigation is that a certain judgment, *e.g.*, "Everything has a cause," is "*à priori*." The psychologist who makes this discovery is apt to trespass on the domain of philosophy, and add "it is therefore true". Now if "everything has a cause" is to be accepted as true, because it is "*à priori*," then for that very reason it is not ultimate; two propositions at least must be accepted before it: 1st, all "*à priori*," judgments are true, and 2nd, this is an "*à priori*" judgment. Both of which are assertions both disputable and disputed. So in loose philosophical discussion it is very common to advance some principle as being self-evident, neither requiring nor possessing any justification, and immediately afterwards to adduce in its support some such argument as that "it is common to all men," or that "it has been implanted in our nature by a benevolent and all-wise Creator". In such cases it is clear either that the principles in

question are not self-evident, or that the arguments used to support them are superfluous.

It is by the consideration of such fallacies as these that I have been induced to use the word "ultimate," when the expression "*à priori*" might appear the most natural. "*A priori*" means independent of experience, but "independent of experience" is ambiguous. It may mean either that experience has not produced the judgment in question, or that it furnishes no grounds for believing it. The first meaning is quite beside the purpose; philosophy has no direct concern with the origin of beliefs, which, as before stated, is part of the subject-matter of psychology. The second meaning, on the other hand, while it excludes experience as a ground of belief, and so far expresses the desired idea, does not express the full differentia of ultimate beliefs, *viz.*, that *there are no grounds for believing them at all*. On the contrary, it sometimes seems to suggest itself directly as a reason for accepting a judgment (as if the fact that experience did not prove anything was a ground for believing it), and sometimes mediately, as showing that the constitution of our mind when in a healthy condition impels us to believe it or that it was implanted in us by the Author of our being; which reasons, whether good or bad, show by the very fact that they are given as reasons, that the judgment called "*à priori*" is not ultimate.

While, then, it is evidently not the business of philosophy to account for ultimate axioms and modes of inference, it is also clear (though it may be hardly necessary to make the remark) that it is not its business to *prove* them. To prove any conclusion is to show that it legitimately follows from a true premiss; so that if we were obliged to perform this operation for our axioms and modes of inference before they were to be received as ultimate, we should be driven either to argue in a circle or to an infinite regress. Indeed, this will sufficiently appear if we reflect that all we mean by ultimate is "independent of proof".

But if philosophy is neither to investigate the causes nor to prove the grounds of belief, what, it may be asked, is it to do? Its business, as I apprehend it, is to disengage them, to distinguish them from what simulates to be ultimate, and to exhibit them in systematic order.

What is meant here by disengaging the grounds of belief in contradistinction to proving them, will appear more clearly if we consider what is done by deductive logic. Deductive logic, apart from the practical rules with which it is encumbered, is (according to the terminology here employed) neither an art nor a science, but a systematic account of an ultimate mode of inference by which it may be distinguished from all other modes,

whether legitimate or illegitimate, whether ultimate or derivative: it is therefore by definition a branch of philosophy.

Now when deductive logic says that any three propositions which can be reduced to the form "All A is B, all C is A; all C is B," are legitimately connected as premisses and conclusion, whatever may be their content, it is by no means intended that such pieces of reasoning derive their validity from the fact of their corresponding with the formula. What is meant is simply to distinguish and mark off a certain mode of inference by giving a general description of it; each particular example of such inference being in itself the witness of its own validity.

This example explains the procedure of philosophy with regard to *inferences*: the axioms of mathematics furnish an illustration of its procedure in the matter of ultimate *principles*. "240 pence and 20 shillings being each equal to a pound, are equal to one another," is one of an indefinite number of similar self-evident propositions, which are described by saying that "things which are equal to the same thing are equal to one another"; but which do not require to be deduced from such general description in order to make them certain. Such a deduction is, no doubt, possible. I may, if I please, say: "Things which are equal, &c."; "240 pence and 20 shillings are things which are equal, &c."; "therefore they are equal to each other". But such a syllogism would be as frivolous as Mill supposes all syllogisms to be; and for this reason, *viz.*, that the conclusion is quite as obvious and certain as the premiss which is introduced to prove it.

It is conceivable, of course, that the axioms at the basis of knowledge are incapable of classification; that no two of them have anything in common except the fact that they are ultimate. In such an event the business of philosophy will be to enumerate, instead of describing them. But this can hardly be the case with modes of inference. The philosophy of deduction is already comparatively speaking, complete; and though the same cannot be said of any other mode of inference, it is difficult to believe that the bond connecting premisses and conclusion differs in every case, so as to exclude the possibility of classification. Something very distantly approaching this state of things would exist if each department of knowledge had a mode of reasoning peculiar to itself, as some have supposed (*e.g.*) theology to have.

To classify inferences is to exhibit what is called their common form. And it is plain that if of two inferences, which by classification have the same form, one is false and the other true, the classification which connects them is philosophically worthless. There would be no use in deductive logic, for instance, if some syllogisms in "Barbara" were trustworthy and others not.



It follows from this very obvious remark that every kind of logic if it is to be philosophical must be formal. The whole object of a philosophy of inference being to distinguish valid and ultimate inferences from those which are invalid or derivative, this can only be done either by exhibiting the common form or forms of such inferences, or (on the violent hypothesis that they have no common forms) by enumerating every concrete instance. To enunciate a form of inference which shall include both valid and invalid examples, can at best only have a psychological interest; philosophically, it is misleading.

The same remark applies *mutatis mutandis* to any classification of ultimate propositions.

There is no ground "*a priori*" (*i.e.*, following from the idea of a philosophy) for supposing that ultimate judgments are general, rather than particular. Of course if they are the latter, there must be some legitimate mode of reasoning from particulars without the help of general propositions.

Neither would I venture to assert that they must be *certain*. To say that our ultimate grounds of belief may be merely probable, will appear a paradox to some, and a truism to others. To me it seems to express a bare possibility. For there are these three remarks to be made on it:—1st. That the desire of certainty being the very thing which impels us to seek a philosophy, mere probability can never thoroughly satisfy our inquiries. 2nd. That, as a matter of fact, it will be found, I think, that no merely probable judgment is ever regarded as ultimate; nobody says of any judgment—"There are no grounds whatever for believing this, indeed none are required, *but I think it probable*". 3rd. That since, according to received doctrines, which for the moment I assume to be true, the probability of any conclusion diminishes rapidly with the number of probable premisses required to prove it, if *many* of our ultimate premisses are merely probable, anything remotely approaching certainty for ordinary knowledge will be out of the question. So that those who aspire to regulate their convictions according to reason, will have to modify considerably their ordinary attitude towards current doctrines.

## II.

Before proceeding to extend and apply these remarks on the idea of a Philosophy in general to the philosophy of Ethics in particular, it is necessary to correct an error which, in these days, when science and the knowable are supposed to be co-extensive, is natural though not the less mischievous:—the error I mean by which Ethics is degraded to a mere section or department of Science. At first sight, and from some points of view, the opinion seems plausible enough. That mankind have passed through

many ethical phases (for example) is a fact in history, and history belongs to science: that I hold certain moral laws to be binding is a fact of my mental being; and, like all other such facts, is dealt with by Psychology—also a branch of science. Physiology, Ethnology, and other sciences, all have something to say concerning the origin and development of moral ideas in the individual and in the race; it is not unnatural, therefore, that some men of science, impressed by these facts, have claimed, or seemed to claim, Ethics for their own.

To hold such a view would be a most unfortunate error; not to hold clearly and definitely its contrary may lead to much confusion. For though, as will appear, scientific laws form necessary steps in the deduction of subordinate ethical laws, and though the two provinces of knowledge cannot with advantage be separated in practice, still the truth remains that scientific judgments and ethical judgments deal with essentially different subject-matters.

Every scientific proposition asserts either the nature of the relation of space or time between phenomena which have existed, do exist, or will exist; or defines the relations of space or time which would exist if certain changes and simplifications were made in the phenomena (as in ideal geometry), or in the law governing the phenomena (as in ideal physics). Roughly speaking, it may be said to state facts or events, real or hypothetical.

An ethical proposition, on the other hand, though, like every other proposition, it states a relation, does not state a relation of space or time. "I ought to speak the truth," for instance, does not imply that I have spoken, do speak, or shall speak the truth; it asserts no bond of causation between subject and predicate, nor any co-existence nor any sequence. It does not announce an event; and if some people would say that it stated a fact, it is not certainly a fact either of the "external" or of the "internal" world.

One cause, perhaps, of the constant confusion between Ethics and Science is the tendency there appears to be to regard the psychology of the individual holding the moral law as the subject-matter of ethics, rather than the moral law itself; to define the position which the belief in such a proposition as "I ought to speak the truth" holds in the history of the race and of the individual, its cause and its accompaniments, rather than its truth or its evidence; to substitute, in short, psychology or anthropology for ethics. The danger of such confusion will partly be shown by the few remarks which follow on the "Idea of a Philosophy of Ethics":—that is, on the *form which any satisfactory system of Ethics must assume, or be able to assume, whatever be its contents.*

The obvious truth that all knowledge is either certain in itself,

or is derived by legitimate methods from that which is so, was sufficiently dwelt on before; and this, which is true of knowledge in general, is of course also true of ethical knowledge in particular. A little consideration will enable us to go on, and state this further fact, which is peculiar to ethics: *The general propositions which really lie at the root of any ethical system must themselves be ethical, and can never be either scientific or ontological.* In other words, if a proposition announcing obligation require proof at all, one term of that proof must always be a proposition announcing obligation, which itself requires no proof. This truth must not be confounded with that which I have just dwelt upon, namely, that Science and Ethics have essentially different subject-matters. This might be so, and yet Ethics might be indebted for all its first principles to Science.

A concrete case will make this second statement clearer. A man (let us say) is not satisfied that he ought to speak the truth. He demands a reason, and is told that truth-telling conduces to the welfare of society. He accepts this ground, and apparently, therefore, rests his ethics on what is a purely scientific assertion. But this is not in reality the fact. There is a suppressed premiss required to justify his conclusion, which would run somewhat in this way—"I ought to do that which conduces to the welfare of society". And this proposition, of course, is ethical. This example is not merely an illustration, it is a typical case. There is no artifice by which an ethical statement can be evolved from a scientific or metaphysical proposition, or any combination of such; and whenever the reverse appears to be the case, it will always be found that the assertion, which seems to be the basis of the ethical superstructure, is in reality merely the minor of a syllogism, of which the major is the desired ethical axiom.

If this principle be as true as it seems to me to be obvious, at one blow it alters our attitude towards a vast mass of controversy which has encumbered the progress of moral philosophy. So far as the proof of a basis of morals is concerned, it makes irrelevant all discussion on the origin of moral ideas, or on the nature of moral sentiments; and it relegates to their proper sphere in psychology or anthropology all discussion on such subjects as association of ideas, inherited instincts, and evolution, in so far, at least, as these are supposed to refer to *ultimate* moral laws. For it is an obvious corollary from our principle, that the origin of an ultimate ethical belief never can affect its validity; since the origin of this belief, as of any other mental phenomenon, is a matter to be dealt with by Science; and my thesis is, that (negatively speaking) scientific truth alone cannot serve as a foundation for a moral system; or (to put it positively), if we have a moral system at all, there must be contained in it,

explicitly or implicitly, at least one ethical proposition, of which no proof can be given or required.

In one sense, therefore, all Ethics is "*à priori*". It is not, and never can be, founded on experience. Whether we be Utilitarians, or Egoists, or Intuitionists, by whatever name we call ourselves, the rational basis of our system must be something other than an experience or a series of experiences; for such always belong to science.

Limited indeed is the number of English moralists who have invariably kept this in view. However foreign it may be to their various systems, an inquiry into the origin or into the universality of moral ideas always appears to slip in, not in its proper place, as an interesting psychological adjunct, but as having an important bearing on the authority of their particular principle. And the necessary result, of course, of these efforts to support ultimate principles is, that they cease to be ultimate, and become not only subordinate, but subordinate to judgments which, if explicitly stated, would very likely appear far less obvious than they.

There is a whole school of moralists, for example, who find or invent a special faculty, intellectual or sensitive, by which moral truth is arrived at; who would regard it as a serious blow to morality if the process by which ethical beliefs were produced was found to be common to many other regions of thought. Oddly enough, these are the very people whose systems are often called "*à priori*". Now if by this term be meant that the ordinary maxims of morality are (according to these systems) independent of experience, it is appropriate enough; but if it be meant that they are self-evident, it is a singular misnomer. For it is clear that on their systems rigidly interpreted those maxims derive their evidence, not from their own internal authority, but from the fact that they bear a certain special relation to our mental constitution; so that the ethical proposition which really lies at the root of their ethics is something of this sort:—"We ought to obey all laws the validity of which is recognised by a special innate faculty, whether called conscience or otherwise." Now, I do not deny that from a philosophical point of view such propositions as these are possible foundations of morals; but what I desire to point out is that such a phrase (to take a concrete case) as "I ought to speak the truth because conscience commands it" may have two widely different meanings, and may belong to two different systems of ethics, not commonly distinguished. According to the first and most accurate meaning, "I ought to speak the truth" is an inference, of which the major premiss must be, "I ought to do what conscience commands," and being an inference, cannot obviously

be an *à priori* law. According to the second and inaccurate meaning, "I ought to speak the truth" is in reality received on its own merits, and conscience is very unnecessarily brought in, either to add dignity to the law or to account for its general acceptance among mankind, or for some other extra-ethical reason. The first of these views is open to no criticism from the point of view of ethical philosophy; so far as form is concerned it is unassailable. But I greatly suspect that most people who nominally found their morality on conscience really hold the second theory; and in that case, as I think, their statement is misleading, if not erroneous.

So far I have only given a negative description of the nature of an ethical proposition. I have said, indeed, that it announces obligation, but this statement is tautological; for if we knew in what obligation consisted, there would be no difficulty in stating the meaning of *ethical*. Beyond this I have only said that an ethical judgment deals with an essentially different subject-matter from either science or metaphysics. Is it possible to say more than this? Is it possible to give any description of ethical propositions which shall add to our knowledge of their character? On general grounds it is plain that this can only be done, supposing that what are *commonly* called ethical propositions form part of a larger class of judgments which resemble them in being neither scientific nor metaphysical, but differ from them in some other respect. This follows from the very nature of description. I myself hold this to be the case. I hold not only that the judgments commonly called ethical (but which, in spite of the clumsiness attendant on changing the meaning of a term in the middle of an essay, I shall henceforward call *moral*), have the two negative characteristics above mentioned in common with a larger class of judgments; but that the distinction between the two classes should be ignored by ethical philosophy, since it depends not on "form" but on "matter". All judgments belonging to either of these classes I shall henceforth call "ethical". Those commonly called ethical I shall describe as "moral"; the rest are either "non-moral" or "immoral". Every possible judgment, then, is either ethical or non-ethical; and every ethical judgment is either moral or non-moral or immoral. The terminology thus being defined, let me explain it, and at the same time my view on the subject.

If a man contemplates any action as one which he chooses to perform, he must do so either because he regards the action as one which he chooses for itself, or because he expects to obtain by it some object which he chooses for itself. And similarly, if he contemplates any object as one he chooses to obtain, he must do so either because he regards that object as chosen for itself,

or because it may be a means to one that is. In other words, deliberate action is always directed mediately or immediately to something which is chosen for itself alone; which something may either be itself an action, or what I loosely term an object. Including both, then, under the term "end," I define an ethical proposition thus:—*An ethical proposition is one which prescribes an action with reference to an end.* Nobody will deny that this definition is true of all moral propositions (most people, indeed, will think that it is too obvious to need stating); but they will probably say, and say truly, that it is also true of a great many propositions which are not usually called moral. Now my object is to show that the distinction between what are usually called moral propositions and that larger class which I have defined above, has no philosophic import—has nothing, that is, to do with the grounds of obligation. And for this purpose let me analyse more carefully this larger class (which I have called ethical) from a philosophic point of view, that is, with reference to the rational foundation and connection of its parts.

(1) Every proposition prescribing an action with reference to an end, belongs either explicitly or implicitly to a system of such propositions. (2) The fundamental proposition of every such system states an end, which the person who receives that system regards as final—as chosen for itself alone. (3) The subordinate propositions of that system are deduced from the fundamental proposition by means of scientific or theological minor premisses. (4) When two such systems conflict, their rival claims can be decided only by a judgment or proposition not contained in either of them, which shall assert which of these respective fundamental "ends" shall have precedence. [Ethics, then, rests on two sorts of judgments, neither of which can be deduced from the other, and of neither of which can any proof be given or required. The first sort declares an end to be final, the second declares which of two final ends is to be preferred, if they are incompatible. This second sort, of course, is not essential to an ethical system, but can only be required when an individual regards more than one end as final.] (5) No other sort of proposition can possibly lie at the root of an ethical system. [This is merely a re-statement of the law dwelt on before.]

Now, in so far as this is a complete philosophical diagram of every ethical system, it must show the sort of authority on which every ethical proposition, every imperative, must rest. Yet since it is plain that this diagram takes no account of the differences there may be between moral and immoral ethical systems, how, it may be asked, can we explain the wide-spread

delusion that these differences affect the authority of the former? This question takes us far afield into the regions of Psychology and Anthropology, but the answer to it may perhaps be suggested as follows. The main reason for this error appears to be false analogy, unchecked by any clear apprehension of the nature of the rational or philosophical peculiarities of an ethical system. And in order to illustrate this and at the same time to place the theory I am defending under as strong a light as possible, it may be as well to examine the exact bearing which Universality and the approval of Conscience (two of the chief characteristics of moral as opposed to non-moral or immoral systems) are supposed to have on obligation.

My position, of course, is that they have *no* bearing; and in order to show this I offer the following analysis to the reader—taking Universality first. A law may be said to be universal in one of four senses. It may mean, first, that all intelligences regard themselves as bound by it. This meaning we need not further consider, not only because it is a scientific assertion, and therefore, as I have shown, incapable of becoming the foundation of an ethical system, but also because it is a scientific assertion now entirely discredited. It is quite out of fashion to maintain that morality is the same in every race and every country, and therefore till, in the revolutions of thought, some one is found to re-assert this doctrine, we need not further discuss it.

The second possible meaning is that by a universal moral law we mean one by which all intelligences *ought* to regard themselves as bound. This also we may dismiss because it amounts to saying that there is a moral law which obliges all intelligences to be bound by other moral laws. Is then *that* moral law universal in the sense we are discussing? If it is, we are committed to an infinite series of moral laws, each commanding us to be bound by the preceding one. If it is not, then there can be a moral law which (in this sense) is not universal.

The next meaning which we can attach to the word universal is this—that by a universal moral law we mean one which *we* think all men ought to obey. That we do think this of most moral laws, and that we do not think it of the other ethical laws, namely the non-moral and the immoral ones, is tolerably certain. It remains to inquire whether the difference bears on obligation; and this inquiry, as it seems to me, may be settled by a very simple consideration. All intelligences means Me and all other intelligences. The first of these constituent parts would be bound by a law held by Me whether it were universal (in this sense) or not. The second would *not* be bound by a law held by Me whether it were universal in this sense or not. In other



words, to be bound by a moral law (and this, by the way, brings out very clearly the difference between being ethically bound and legally bound) is exactly the same thing as to regard it as binding on you; it is not to regard it as binding on some one else, and it is not for some one else to regard it as binding on you; it has therefore, and it can have, no connection with Universality in this third sense.

It is, of course, open to any one to assert that he recognises no imperative which is not universal (in this sense). This may very well be the fact, and I have no wish to deny it. What I deny is that the connection of the two is other than empirical and accidental, or that it has any place in the philosophy of obligation.

The fourth and last meaning which I am able to attach to the word universal when used of a law, is that it signifies that all people of "well-constituted minds" do as a matter of fact regard themselves as bound by a law so qualified. Now, if "well-constituted" is defined with reference to morality, and means "holding the one true moral system," a proposition that all true or right moral laws are universal is frivolous and merely verbal. If it be defined with reference to something else—if it means, for instance, sane, or well-educated, or Christian, or scientific, or anything non-moral, then the same arguments may be used to show that universality in this sense cannot be a ground of obligation as I used when speaking of the first sense. For a proposition asserting that any considerable body of men, distinguished from the rest of mankind by some non-moral attribute, hold the same moral code, is very likely to be questionable, and being a scientific assertion, is quite certain to be irrelevant.

As regards Conscience, I have shown before, that to assume a special faculty which is to announce ultimate moral laws can add nothing to their validity, nor will it do so the more if we suppose its authority supported by such sanctions as remorse or self-approval. Conscience regarded in this way is not ethically to be distinguished from any external authority, as, for instance, the Deity, or the laws of the land. Now, it is plain that no external authority can give validity to ultimate moral laws, for the question immediately arises, why should we obey that authority? Only two reasons can be given. The first is that it is *right in itself* to obey; the second is that (through a proper use of sanctions) it will be *for our happiness* to obey. Now, the first of these reasons is a moral law, which obviously does *not* derive its validity from the external authority, because the external authority is an authority only by means of it. And the same may be said of the second reason, substituting the words "ethical but non-

moral" for the word "moral". In neither case, then, is the external authority the ultimate ground of obligation.

The inevitable ambiguity which arises from the sudden extension of the meaning of the word "ethical" to imperatives which are immoral or non-moral, makes it, perhaps, desirable that I should very concisely re-state from another point of view the main position I have been attempting to establish.

All imperatives, all propositions prescribing actions, have this in common:—That if they are to have any cogency, or are to be anything but empty sound, the actions they prescribe must be to the individual by whom they are regarded as binding, either mediately or immediately desirable. They must conduce, directly or indirectly, to something which he regards as of worth for itself alone. The number of things which are thus in themselves desirable or of worth to somebody or other is, of course, very great. Pleasure or happiness in the abstract, other people's pleasure or happiness, money (irrespective of its power of giving pleasure), power, the love of God, revenge, are some of the commonest of them, and every one of them is regarded by some people as an end to be attained for its own sake, and not as a means to something else. Now, it is evident that to every one of the ultimate propositions prescribing these ends, and for which, as the ends are ends-in-themselves, no further reason can be given, there will belong a system of dependent propositions, the reasons for which are that the actions they prescribe conduce to the ultimate end or end-in-itself.

If, for instance, revenge against a particular individual is for me an end-in-itself, a proposition which prescribes shooting him from behind a hedge may be one of the subordinate or dependent propositions belonging to that particular system. But whereas the indefinite number of such systems is thus characterised by a common form, it is divided by ordinary usage into three classes, the moral, the non-moral, and the immoral, about the denotation of which there is a tolerable agreement. It would be universally admitted, for instance, that a system founded on the happiness of others was a moral system, while one founded on revenge was immoral: and, though there would be more dispute as to the members of the non-moral class, this is not a question on which I need detain the reader. The denotation then of these names being presumably fixed, what is the connotation? or to simplify the inquiry, what is the connotation of a *moral* system? The apparent answers are as numerous as the number of schools of moralists. But however numerous they may be, they can all be divided into two classes. The first class merely re-state the denotation, in other words, announce the ultimate end-in-itself of the system, and so, properly speaking, give no answer at all.

A Utilitarian, for example, may simply assert that the greatest happiness of the greatest number is for him the ultimate end of action. If he stops there he evidently shows no philosophic reason for distinguishing the system he adopts from the countless others which exist, or have existed. If he attempts to give any further characteristic of his system, he then belongs to the second class, who do indeed explain the connotation of the word moral according to their usage of it, but whose explanations have, and can have nothing to do with the grounds of action or the theory of obligation. The sanction of conscience, emotion of approval, expectation of reward, feeling of good desert, glow of conscious merit—these are all most undoubtedly marks or characteristics of moral actions; how they came to be so, whether by education, association of ideas, innate tendency, or howsoever it has happened, matters nothing whatever except to the psychologist; that they are so is certain, but the significance of the fact is habitually misunderstood. Are they simply the *causes* of good action? Then they have nothing to do with Ethics, which is concerned not with the causes but with the grounds or reasons for action, and would remain wholly unchanged if not a single man ever had done or could do right. Are they the *ends* of action? Is the fact that they are obtained by a certain course a valid reason for pursuing that course? In that case they stand to the person holding that opinion in precisely the same relation as money does to the miser, or revenge to the savage. They are the groundwork of an ethical system, and to state them is simply to denote *what* ethical system it is which is being alluded to. Are they, finally, not ends of action, but merely marks by which certain actions may be known to belong to a particular system? In that case, and for that very reason, they can have nothing to do with the grounds or theory of obligation. Therefore, finally, though under the general name "ethical" are included not only moral, but also non-moral and immoral systems, the distinction regarded from the outside between these sub-divisions is not essential, and has no philosophic import—which was the thing to be proved.

### III.

Before concluding these remarks, I would point out three corollaries that may be drawn from them, which are not without interest. The first corollary is—that no instructive analogy exists between Ethics and Æsthetics. It is true, no doubt, that philosophers have talked about the Good and the Beautiful, as if they were co-ordinate subjects of investigation, and that in ordinary language we say both that a picture "ought" to be admired, and that an action "ought" to be performed. Nevertheless, reflecting on actual or possible æsthetic systems, it would

seem clear that they must be included under one of four heads. They must belong either (1) to Ethics, or (2) to Psychology, or (3) to Ontology, or, lastly (4), to Ontology with an ethical or psychological element superadded. And in none of these cases can *Æsthetics* be said to rank as a parallel subject of inquiry with Ethics.

The first of these possibilities, namely, that *Æsthetics* belongs to, or is included in Ethics, I mention chiefly for the sake of completeness. Even those art-critics whose denunciations of bad taste approach most nearly to the level of moral reprobation, hardly maintain that it is our *duty* to admire the *Venus of Milo* in the same sense as it is our *duty* to love our neighbour. If any do hold this view, the conclusion to be drawn is, not that their æsthetic code stands on a different, but similar, platform to their ethical code, but that their ethical code is larger than that of ordinary people, by the whole amount of their *Æsthetics*.

According to the second of these possibilities (namely that *Æsthetics* belongs to Psychology) *Æsthetics* is merely the investigation of the nature and causes of peculiar emotions—chiefly secondary—produced in us by certain external causes, objects, or representations, and has no more to do with Ethics, either by way of resemblance or contrast, than any other department of Psychology.

The third possibility, namely, that *Æsthetics* belongs to Ontology, includes all such theories of the Beautiful as deal exclusively with "objective standards," "ideas," or "archetypes," "the evolution of the Idea," or "the perception of the agreement of the Subject and Object," and such-like. Taken by themselves, these theories belong to Ontology; but if there be added any consideration of the relation these ontological entities or processes bear to the individual, these considerations must belong either to the first or the second of the above-mentioned possible treatments of *Æsthetics*, and must, therefore, be either ethical or psychological. This is the fourth possibility.

From this concise analysis, then, it would seem clear that no analogy exists between Ethics rightly understood and any system right or wrong of *Æsthetics*. But if that be so, how comes the existence of any analogy even to have been supposed? The reply to this is, that there does exist an analogy between some theories of *Æsthetics* and Ethics *wrongly* understood. Some moralists, for example, have dwelt largely on the emotion excited in us by virtuous actions. And if the scientific examination of these emotions really constitute the essence of Ethics, there is unquestionably an analogy between theories of the Good and some theories of the Beautiful.

Again, if ethical inquiries are thought to resolve themselves

into researches concerning the existence and nature of some objective standard of right, it is inevitable that they should suggest, and it is probable they would resemble, those other ontological inquiries concerning the objective standard of beauty. Now it must not be supposed that I pronounce either of these investigations irrational: all I contend for is that they are not ethical; or, rather (to avoid a dispute about words), what I contend for is, that they have nothing, and can have nothing, directly to do with Obligation.

The second corollary concerns the functions of the Moral Philosopher. It is clear from what precedes, that it is *not* the business of the moral philosopher to account for the origin of moral ideas, or to analyse and explain that growth of sentiment which collects around the time-honoured maxims of current morality. These are topics which belong to Psychology. Neither is he expected to prove the propositions which lie at the root of any system of morals; for these are incapable of proof. Nor, for the same reason, can he justify the judgments which declare which of two final ends is to be preferred in case of conflict, or how much of one is to be preferred to how much of the other. Nor, in reality, has he any but a subordinate part to play in expounding or deducing the derivative rules of morality; and this for the following reason.

The deduction of any derivative rule is always necessarily in this form: "The happiness of mankind ought to be promoted" (this, let us say, is the ultimate unprovable foundation of the system); "monogamy promotes the happiness of mankind" (this is the scientific—in another system it might have been theological—minor premiss); "therefore monogamy is a system which ought to be supported". This is the required derivative rule. Now the only difficulty in deducing this conclusion from the first principle of the system lies in the difficulty of demonstrating the minor premiss; in other words, it lies in the difficulty of a certain sociological investigation, which the speculative moralist as such cannot be expected to undertake.

The important duties of the moralist, for he has important duties, arise from the confused state in which the greater part of mankind are with regard to their ethical first principles. The two questions each man has to ask himself are:—What do I hold to be ultimate ends of action? and,—If there is more than one such end, how do I estimate them in case of conflict? These two questions, it will be observed, are questions of fact, not of law, and the duty of the moralist is to help his readers to discover the fact, not to force his own view down their throat by attempting a proof of that which is essentially, and by its very nature, incapable of proof. Above all, he must beware of sub-

stituting some rude simplification for (what may perhaps be) the complexity of nature, by deducing (as the Utilitarians do) all subordinate rules from one fundamental principle, when, it may be, this principle only approximately contains actual existing ethical facts.

Since these two questions can be answered, not by ratiocination, but only by simple inspection, the art of the moralist will consist in placing before the inquirer various problems in Ethics free from the misleading particulars which surround them in practice. In other words, his method will be casuistical, and not dogmatic.

It may perhaps seem strange that, after commenting at some length on the prevailing confusion between Ethics and Psychology, I should now have to announce that the business of the Ethical Philosopher (at least, so far as first principles are concerned) is as purely psychological as, according to the two preceding paragraphs, I make it out to be; and it may seem, therefore, as if the difference between my view and that of the philosophers whom I have attempted to criticise is by no means essential or important. This, however, is not the case. My complaint against these philosophers is that they appear to suppose that a psychological law can serve as a rational basis for an ethical system; so that their chief aim often seems to have been the establishment of their own particular views on the origin and nature of our moral sentiments. I, on the other hand, altogether deny the possibility of such a basis, and maintain that all that a moralist can do with regard to ethical first principles is, not to prove them or deduce them, but to render them explicit if they are implicit, clear if they are obscure. To do this effectually he must, of course, treat of ideas and notions, and his work will therefore, in some sense, be undoubtedly psychological. To make this statement complete, I should add that (as appears by my next paragraph) there is no absurdity in supposing that a moralist may in the course of his speculations hit on some entirely new first principle which he has not held even obscurely before, but which commends itself to his mind as soon as it is presented to him.

The third corollary I draw is this—that there are only two senses in which we can rationally talk of a moral system being superior to the one we profess. According to the first sense, superior means superior in *form*, more nearly in accordance with the ideal of an ethical system just sketched out. According to the second sense, in which the superiority attaches to the *matter* of the system, it can only mean that the system is one of which we are ignorant, *but which we should adopt if presented to us*. It is a hypothetical superiority.

Now it must be observed that the sense in which we speak of other hypothetical systems as being superior to our own, is by no means identical with that in which we speak of our own as being superior to that of other people. Looking back over history we perceive a change and development of the moral ideas of the race in the direction of the systems which now prevail; and this change we rightly term an improvement. But if, arguing from the past, we suppose that this improvement will continue through the indefinite future, we are misled by a false analogy. The change may very well continue; the improvement certainly will not. And the reason is clear. What we mean, or ought to mean, by an improvement in the past is an approach to our own standard, and since any change at all corresponding in magnitude to this in the future must involve a departure from that standard, it must necessarily be a change for the worse.

In other words, when we speak of another system as being superior (in matter) to our own, we speak of a possible system which we should accept if we knew it. When we speak of our own system being superior to that of some other person, we assert the superiority unconditionally, and quite irrespectively of the possible acceptance of it by that other person, supposing him to be acquainted with it. If then we believe that development will proceed in the future as it has done in the past, we must suppose that a time will come when the moral ideas of the world will be as much out of our reach, supposing them presented to us, as ours would be out of reach of primitive man. This is also true of scientific ideas: but there is this difference between them, that whereas the change in scientific ideas may be an improvement, that in moral ideas must be a degradation. The grounds of this distinction, of course, are obvious; *viz.*, that the standard of excellence in the case of scientific ideas is, or is supposed to be, conformity to an infinitely complex external world—a conformity which may increase with every change in the ideas. The standard of excellence, on the other hand, in moral ideas must necessarily be conformity to our actual ideal, and this conformity must diminish with every change in the ideas.

This point would not perhaps have been worth dwelling on, if it was not that the discussion brings into strong relief the nature, so far as form is concerned, of the criterion of Right, and has also some bearing on current theories of optimistic Evolution, with which I confess it does not seem possible easily to reconcile it.

ARTHUR JAMES BALFOUR.



## VI.—PHILOSOPHY IN THE DUTCH UNIVERSITIES.

THE history of Philosophy among the Dutch has never yet been written. It would have little to record beyond a long series of infiltrations of foreign thought into the science, theology and literature of the Northern Netherlands. Its one great name would be that of Spinoza; and him we can scarcely consider a fair representative of the native habit of thinking. In the average learned Dutchman there is much less of his speculative daring than of the sceptical conservatism of old Erasmus. Born of a race of thrifty citizens and husbandmen, he fully appreciates the value of accurate knowledge and sound scholarship, but pure theory he generally distrusts, as likely to unsettle the even balance of his mind, and endanger the peaceful progress of human affairs. As the late Professor van Heusde puts it: "in philosophising we ask for simplicity, good sound sense, and especially good principles, that should in no wise disagree with those of our religious doctrine". Hence philosophy is valued rather as a mental exercise to be taken with moderation than as a pursuit for life after fundamental truth. For the purpose in view a summary acquaintance with existing theories and their shortcomings is commonly thought sufficient, while strict consistency is given up as a hopeless pretension, and people on their own part acquiesce in some mild and tolerant variety of Protestantism.

On the other hand there is a steady demand for French, German, and English literary productions. And in the nation itself we find a considerable admixture of foreign elements from the most different parts, to which it is indebted for much more discrepancy of opinion than one might be inclined to look for in so small and so untroubled a community. Ultramontanism, Calvinism, and Positivism, Toryism and Radicalism, all have their steadfast adherents, and there can hardly be a party in the civilised world without its sympathisers in the present kingdom of the Netherlands. Nevertheless, as in England, while everybody is speaking his mind and it frequently comes to sharp altercations, this very continuance of verbal strife has proved conducive to independence of opinion and, in the main, to a prudent forbearance from extremes.

In the present slight sketch—which will be strictly confined to Dutch Academical Philosophy—it would take us too far to give an account of anything anterior to the Reformation. There were a few creditable schools, founded chiefly by Gerardus Magnus and his brotherhood since the fourteenth century, but the higher order of education, and all academical degrees, had to

be sought for abroad. When the change of religion made Popish universities unavailable, William of Orange persuaded the Provincial States of Holland to provide for the establishment at Leyden of a complete set of Faculties, namely Theology, Law, Medicine and Arts. To the new university a charter was granted by the Prince Stadholder under the legal fiction of an order from the nominal sovereign, King Philip II. of Spain (1575). Ten years after this, the Frisian States, on their own authority, founded a similar institution at Franeker, and their example was followed in time by those of the town and country of Groningen (1614). Harderwijk on the Zuider-Zee had a college added to its old established grammar-school by the district authorities of the Veluwe (1600), and this was afterwards endowed with the privileges of a university by the States of Gelderland (1648). The old episcopal town of Utrecht, long desirous of the same advantages, succeeded in establishing a college of its own (1634), which received academical prerogatives from the Provincial States in 1636. About the same period (1630 and 1632) identical measures were adopted by the cities of Deventer (in Overijssel) and Amsterdam. In both those cases, however, the *Athenæa* or *Illustrious Schools*, as they were called, have never been empowered by the supreme authorities to confer degrees, until, by the University Law of 1876, one has been suppressed altogether, and the other promoted to the rank of a municipal university. Meanwhile, after various accidents, Harderwijk and Franeker had been finally abrogated in 1818 and 1843 respectively. Other *Athenæa* had existed for some time at Nimeguen, Dordrecht, Bois-le-Duc, Breda, and Middelburg.

As all these places of education depended on different sovereign powers, there was no perfect similarity in their laws and customs. The statutes of Leyden, framed by a far-sighted statesman like William the Silent, were the most liberal of all, enacting no religious or philosophical restrictions. At Franeker all the professors had to subscribe to the confessional symbols of the established Presbyterian Church, and Groningen at least did not abandon this point until 1801. Utrecht copied Groningen in one more respect. The statutes of both contain the following article: "*Philosophi ab Aristotelis philosophia non recedunto,\* propugnatores absurdorum paradoxorum et inventores dogmatum novorum ab Aristotelica doctrina discrepantium non feruntur*". In practice we shall presently find public opinion more powerful than either the liberty allowed in some places or the prohibition enacted in others.

\*Utrecht added the clause "*neque publice neque privatim*". All the old academical statutes were superseded by the Royal Decree of 1815.

Unlike all other continental universities, those of the United Netherlands were always subjected to boards of Curators, men of rank and note, who often wielded the power of appointing and even discharging professors. They never belonged to the body of the university, but acted as delegates of the sovereign who provided for its wants.\* By their prudence, and the resistance they offered to clerical dictation, they were of great service in preserving freedom and peace. Of course the Calvinist clergy, inspired by zealous refugees from France and Belgium, kept struggling for influence upon the teaching at least of their own Faculty, and more than once, when they got for a moment the upper hand in public affairs, they obtained some temporary advantage. Yet the town corporation of Leyden declared from the first, that they were not willing to admit the inquisition of Geneva while making war against that of Spain. And when the famous Synod of Dordrecht demanded an ecclesiastical Curator to look after the theological faculty, its resolution remained a dead letter, and the regular Curators prevented the local synod from meddling with academical government. But the interests of their position forbade their giving countenance to very small minorities; and Spinoza, perhaps, was not far wrong when in the *Tractatus Politicus* he wrote: "*Academiae, quae sumptibus reip. fundantur, non tam ad ingenia colenda quam ad eadem coercenda instituuntur*".

Of college life as in England and at Cologne or Louvain, there was no question except in the case of certain exhibitioners, nearly all destined for the Church. Each university had its *bursa* or *œconomia*; at Leyden the States' College subsisted from 1592 to 1810, the Collegium Gallo-Belgicum (for preachers in the French language) from 1606 to 1703. Even within these the "regenting or tutorial system" found no favour. The Principal (called *Regens*) and his vicegerent merely repeated with the alumni what they learnt from the Professors common to all; and other undergraduates found plenty of private

\* At Leyden, Franeker, Harderwijk, they were separate boards commissioned by the Provincial States and the Stadholder. At Groningen, where the sovereignty was divided between the town and the country district, each appointed its own half of the board. At Utrecht the civic authorities were themselves the Curators, who took care not to allow any academical jurisdiction, whereas at Leyden the burgomasters sat with the Curatorial board, and also in the Rector's tribunal. From 1815 the burgomaster (or mayor) of each university-town was *ex officio* one of the Curators, but the new Law contains no such stipulation. Of course under the present Constitution the board is in its turn subordinate to the Minister of the Interior, there being no separate department of Education. The idea of the office was evidently suggested by the *Conservatores privilegiorum* of older universities.

teachers ready to help them on in the same way. On Wednesdays and Saturdays there were no public lectures, but men went to hear Extraordinary Professors and licensed Readers, and, under the superintendence of any official teacher, tried their own powers in disputation.

The oldest Leyden Faculty of Arts (or Philosophy as it was surnamed) consisted of six Ordinary Professors, for Logic, Physics, Mathematics, and the three learned languages. Ethics was commonly regarded with some suspicion on account of its heathenish tendency; and Metaphysics also because of the Humanists' and Protestants' natural aversion from mediaeval subtleties. Still both were admitted as extraordinary subjects from the first, and before the middle of the seventeenth century they had obtained their place in the regular curriculum. Everyone, especially the candidate for orders, was expected to begin his studies with Humanities and Philosophy, although a degree in Arts was by no means looked on as indispensable. Nor do we find the degree of Bachelor taken except in a very few instances.\* To the title of *Artium Liberalium Magister* that of *Philosophiae Doctor* was superadded at a very early period, so as to put the graduates markedly on a level with the "Doctors" of the other Faculties; the celebrated Gerardus Vossius became the first A.L.M., Ph. D. of Leyden in 1598.

As might be presumed, the official philosophy was the mitigated Scholasticism adopted in the Protestant schools of the time. Of Ramism there is hardly a trace.† Jac. Arminius the divine and Rud. Snellius the mathematician, both Hollanders from Oudewater, who had taught the dialectic of Ramus in Switzerland and Germany, were called to other duties at Leyden. Two occupants of philosophical chairs, Corn. de Groot (Leyden 1575) and Henr. de Veno (Franeker 1602-13) are mentioned as inclined to Platonic doctrines, meaning apparently some form of modernising eclecticism. As far as I know, de Groot's successor Nic. van Dam (1575-79) was an Aristotelian, and so were three Belgian professors at the same place, Alex. de Ratlo (1578-87), Ant. Trutius (1582-93), and Adr. Damman (1586-88).‡ After these and the insignificant Westerhovius (1583-84) came a Frenchman the elder Pierre du Moulin (*Molinaeus*, 1593-98), afterwards a minister at Paris, and

\* At Bologna the Bachelor's degree was altogether unknown.

† Prof. Jo. Hachting of Franeker (1622-30), published a *Dialectica Petri Rami* in 1626. In mere grammar-schools the doctrine appears to have found more favour.

‡ Ratlo had been in England, and Damman is probably the same who was called to Scotland by Geo. Buchanan, and wrote to Lipsius from Leith, in 1590.

several Scotch Peripatetics: Jas. Ramsay (1588-93), John Makolo (MacCulloch? Reader in Logic 1597), John Murdison (1600-5), and Gilbert Jack of Aberdeen (*Jacchaetus*, 1603-28)\* Some writers have supposed a connection between the Aristotelian and the Calvinist predominance of the period; but there is no indication of nonconformity in the philosophy of the Remonstrant (or Arminian) party. Petr. Bertius, Ger. Vossius, and Caspar Barlaeus clearly belong to the same school with those by whom they were superseded in their offices in 1619 (to please the friends of the Synod of Dordt), Frank Burgersdijk (d. 1635) and Dan. Mostert (*Sinapius*). At Franeker, Lollius Adama (1585-1609), Andr. Roorda (1611-21), probably Joach. Andreae (1613-20), and certainly Arn. Verhel (1618-64) taught in the same spirit. At Groningen the first philosophical appointment was that of another Scotchman, Geo. M'Dowell, a native of Maxton on the Tweed, who was called from St. Andrews at the age of twenty-four. From the professor's chair, which he occupied from 1614 to '27, he stepped into that of a presiding military judge, and in time rose to be Charles II.'s ambassador at the Hague (1650). Nor did his academical successors, Franc. Meyvart from Ghent (1620-40), Mart. Schoock from Utrecht (1640-65), and Jo. Bertling (1667-90), swerve from the received doctrine. Schoock was a partisan, soon to become a private adversary, of Gisbert Voet, the Utrecht pillar of orthodoxy, and enlarged in print upon an endless variety of subjects, from Papacy and Cartesianism down to butter, herrings, and beer. In the Deventer College the Peripatetic banner was firmly upheld by a learned and far-travelled Doctor of Paris, Gisbert van Isendoorn (1634-47), who taught for nine years more at Harderwijk in his native province (1648-1657), and then died in peace, after obtaining a Curatorial resolution against the Cartesian heresies.

During this first period, before the irruption of really original thought, Aristotle was cherished mainly as a guarantee for *bona fide* logical studies, as opposed to the slipshod facility that the Ramist and similar schools were contented to impart. Even so accomplished a classical scholar as Hugo Grotius was not to be deceived as to the mediocrity of the boasted disciples of Cicero, but recommended Murdison for the long vacant chair of Logic, and urged Jack to write his *Instt. Primae Philosophiae* (1616); while all the Peripatetic text-books of the time are adorned with laudatory verse by such men as Dan. Heinsius,

\* On the Scotch Philosophers in the Dutch Universities I shall be happy to exchange notes with their learned countrymen. Of Eglesham or Egleshamus, mentioned by Prof. Veitch in No. V. of *MIND* as a Professor at Leyden, I have not been able to find a trace in any part of the country.

Ger. Vossius, Pet. Cunaeus, and Casp. Barlaeus, whom no one will suspect of a tender regard for the Middle Ages. Of those books one at least will be known by name to most readers of philosophical history. The Grammar Schools of that time retained not only the name of *scholae triviales*, but actually taught the old *trivium*: Grammar, Dialectic, and Rhetoric. Their work was found insufficient at the University; so the Provincial States directed the schools of Holland to be provided with standard treatises, and by their order Vossius wrote his *Grammatica* and *Rhetorica*, and Burgersdijk his *Institutiones Logicae* (Lugd. Bat. 1626), good scholarly works, that made their way all over Europe.

The old school having thus prepared everything for undisturbed dominion, was very soon after to be involved in a struggle for life with an enemy from quite a unexpected quarter. On April 16, 1629, the Rectór of Franeker registered the name of *Renatus des Cartes, Gallus, Philosophus*. Not finding, as it seems, the scientific intercourse that he wished for, that habitual traveller soon returned to Amsterdam, whence he made only a short trip to England. At Amsterdam he made the acquaintance of the private tutor of some young men, Henri Reniers (or Renery as he writes the name), a Belgian convert from Romanism and then recently disappointed of a Leyden professorship. This new friend was called to a chair at Deventer in 1631, and in 1634 to one at Utrecht, where he died after a short time from sheer hard work. In both places he explained the tenets of his French master, cautiously but devotedly; as he wrote to Mersenne: "*is est mea lux, meus sol, erit ille mihi semper Deus*". At his death in 1639, not only his philological colleague and countryman Aemilius, but several of the magistrates and of the students held with him, and one of his pupils, Henr. de Roy (or le Roy, *Regius*), was teaching physiology on his principles with great applause. However, Regius in his medical chair thought fit to attack the Aristotelian school in such a style as to move the wrath, not only of his philosophical colleagues, Arn. Senguerd (1639-48) and Dan. Berckringer (1640-67), but of their mighty theological protector Gisbert Voet, himself an old pupil of Jack and private teacher of Burgersdijk. This indefatigable champion of things constituted immediately began his operations, first making his pupils protest in their customary theses, and then procuring two decrees against the enemy, one of the Town Council, limiting Regius to his medical profession, and the other of the Academical Senate. In the latter the body of professors disapproved the new Philosophy for three notable reasons: first, because it contradicted the old system, secondly, because it kept the students in ignorance of the meaning of old terms, and lastly, because it

led, or might appear to lead, to consequences in opposition with other sciences, especially with orthodox Theology. Another pupil of Voet, Schoock at Groningen, was inspired by his master to publish a damnatory tract against Cartesianism. The irritable French philosopher, who had at first prompted the faithful Regius with arguments at his request, but wished to keep the peace as long as possible, now found himself openly accused of nothing less than Atheism, a rather dangerous charge even in the free republic, and resorted in his turn to vigorous measures. Besides publishing his well-known Letter to Voetius, he applied to the ambassador of his country, and with his aid to the Senate of Groningen and the Utrecht magistrates. After much throwing-up of polemical dust, Utrecht forbade its printers to publish any more controversial writings on either side (1645), and Schoock, who had betrayed the suggestions of his chief, narrowly escaped an action for libel on the latter. Henceforth peace reigned at Utrecht, under the auspices of Voet and his two sons Paul and Daniel, each in turn called to a philosophical chair by his influence (1641-53 and 1653-60). Straight from the deathbed of the younger the brave old father went forth to make interest with the authorities for the Aristotelian cause, but this time the office was given to a young kinsman of some of the town magnates themselves, Regnerus van Mansvelt, a Cartesian (1660-71). Only a few years before his death, the veteran divine had the satisfaction of seeing another of his true pupils, Gerard de Vries, first a reader (1671-72), and then a professor (1674-1705) in the place of his offspring. Yet towards the end of the century this same de Vries was reported to have but little influence, and to have yielded on certain points to the current of neology.

Meanwhile at Leyden the study of Philosophy had not thriven under the successors of Burgersdijk: Jo. Bodecherus the Latin poet (1629-38), Dan. Sinapius, promoted from his place in the States' College to an ethical professorship (1635-38), and Franc. du Ban, a Frenchman (1635-43). In 1641 the glib-tongued Adr. Heereboord\* attempted to revive it, protesting against the slavish respect for Aristotle, which that great thinker would have been the first to disclaim, and teaching Logic on a plan of his own. Of course he was called to account before the Rector, Otto Heurnius, an aged professor of medicine who had lectured on Logic in his early days; but the Curators allowed him to proceed as he had begun. Soon after this we find him in raptures with the first works of Descartes, and what with his lessons, the reports from Utrecht, and the residence of the French thinker in Leyden and its neighbourhood, the seeds of neology began to

\* One of his works, the *Philosophia Naturalis*, is said to have been reprinted at Oxford in 1665.



germinate among the students. To escape this danger, some conscientious youths actually went to Utrecht for lectures on orthodox Metaphysics; so the Leyden Curators, at the urgent request of their theological faculty, determined for the first time to open a public metaphysical course (1644). On the advice of Salmasius they secured the services of Adam Stuart, "*vir in philosophia Roscius*," sometime professor at Sedan, whose Scotch antecedents I have not been able to discover, but who at that time appears to have stayed in London. He at once proved himself as ardent a controversialist as any of the Voet family, and openly opposed Heereboord, who since 1645 had lectured on Ethics as well, and had sought to point out the difference between the followers of Aristotle and those of Nature. The great topics of the day, the legitimacy of universal doubt, and the attributes of the Deity, were drawn into every public disputation, and such was the vehemence of Revius, Regent of the College, and Trigland, a Professor of Divinity, that Descartes lodged a formal complaint with the Curators (1647). He only obtained a decree prohibiting all mention of his theories in the University. But Stuart, continuing his attacks on the doctrine without naming its author, found a fresh opponent in Jo. de Raey, doctor of medicine and a pupil of Regius, who had played a part in the Utrecht quarrel six years before, and now insisted that the decree should be respected to the letter by one party as well as the other. This led to violent scenes and some passionate pamphlet writing, after which the Curators put a stop to the proceedings (1648).

For the next quarter of a century their policy appears to have been one of mediation. In 1656 the professors of Philosophy and Divinity had to promise not to encroach upon each other's province. Adam Stuart died in 1654, but by that time de Raey had been his colleague in the faculty for three years (1651-68). Poor Heereboord, addicted to wine and rather a shallow rhetorician, died in 1661, and was replaced by David Stuart, who inherited the opinions of his father without his quarrelsome temper (1661-69). During the same time the Leyden students had the opportunity of hearing a talented Cartesian from foreign parts, Arnold Geulinx. Born at Antwerp, and educated at Louvain, he had been a brilliant professor in that university for twelve years, but fled from the place to become a Protestant at Leyden, where he was looked on with suspicion, and only supported by the charity of a theological professor, Abr. Heidanus. At last an extraordinary professorship was bestowed on him (1665), but poverty and disappointment put an untimely end (1669) to the career of one too little known, whom I incline to consider the most original thinker ever seated in a Dutch

philosophical chair. In 1669 and '70 the balance of parties was reversed by the appointment of two decided Cartesians, Burcherus de Volder (1670-1705) and Theod. Kranen (1670-73), while the tradition of Scholasticism was preserved by a mere reader, Wolfert Senguerd, the son of the Utrecht Aristotelian, who had spent his last years (1648-67) at the Athenæum of Amsterdam.

However the French invasion of 1672 and the nomination of William III. drew on a reaction in favour of the time-honoured system. Fred. Spanheim, the theologian, often annoyed by petulant Cartesian juniors, had the consolation of seeing some of them banished from the University; Kranen removed into the medical faculty; while Senguerd and a certain Wilhelmius were installed as professors (d. 1724 and 1677). De Volder, a peaceful savant, though faithful to the losing side in politics, kept his place mainly on account of his skilful scientific experimenting. Moreover the clergy prevailed upon the Curators to promulgate a syllabus of errors not to be defended any more; for instance, "*Om nem philosophiam esse religionis expertem, summumque hominis bonum esse animum sua sorte contentum*". Heidanus venturing to remonstrate against this measure both as a Cartesian and a Coccejan in theology, was ruthlessly deposed in his eightieth year (1676); while a scrupulous French divine, Steph. le Moyné, took courage to accept office in a university thus happily purified of modern abominations.

Warded off, as far as possible, from Leyden and Utrecht, the new philosophy continued to flourish at Amsterdam, where its staunch defender de Raey professed from 1669 to 1702, and Jo. Theod. Schalbruch, the editor of Clauberg's works, from 1698 to 1722.\* Even at Harderwijk it was favoured by Corn. van Thiel (1655-88), and more openly by Ger. Wijnen (1691-1722); and at Groningen, notwithstanding the Statutes, by the historian Tob. Andreae (1634-76), Ger. Lammers (1667-69), and two Huguenot refugees, Jac. Gousset (1691-1704) and Mich. Rossal (1724-44). Franeker was a hotbed of Cartesianism under Jo. Greidanus (1658-68), Jo. Wubben (1664-78), Jo. Schotanus a Sterringa (1678-99), Abr. Gulichius (1679-80), Tob. Andreae the nephew (1681-85), Herm. Alex. Roëll (1686-1704), and Ruard Andala (1701-27). Yet here also the Scholastic tradition was designedly kept up by the appointment of Christoph. Munster (1651-60), Abr. Steindam (1664-72), and Jo. Regius (1686-1738), the last of his tribe, who had to eke out his means by the practice of medicine, while striving to the last to stem

\* Of the philosophical teaching of the famous Tib. Hemsterhuis (Amst. 1705-1717) there is little or no record.

the flood of modern speculation. A common weapon against Cartesians in those latter days was an accusation of Spinozism, which was repeated likewise against their successors.

Of these the foremost in age and fame was the great experimentalist Will. Jac. 's Gravesande, who had visited England as secretary to the ambassadors sent to compliment George I. on his accession to the throne. Called to a chair of astronomy and mathematics at Leyden in 1717, he was the first on the Continent to teach the natural philosophy of his revered friend, Sir Isaac Newton.\* From 1734 to his death in '42 he also lectured on Mental and Moral Philosophy, and here he was evidently inspired by the doctrine of Leibnitz, as vulgarised in the writings of Christ. Wolff. Thenceforth the professor of Philosophy in the United Provinces was a physicist in the first place. Logic had, since the disgrace of Peripatetic lore, lost much of its attractions. So had Metaphysics, when the students of nature began to give up even Cartesian hypotheses, and attempting to proceed by the light of experience alone cared for abundance of ascertained facts rather than systematical completeness of theory. Reason had ceased to assert its omnipotence, though it retained its feeling of responsibility and a distrust of theories not altogether "clear and distinct". Accordingly, on ethical as well as metaphysical subjects, it was fain to retire upon safe generalities, getting clear of troublesome questions by a *non liquet*, or an appeal to Christian revelation. The title of Eclectic came again into favour, and Cicero was hailed once more as the model of a philosopher. Calvinism, too, had lost much of its rigidity, and could hardly find fault with a Philosophy so modest, and so ready to stand sentinel against the many sad infidels of the day. In this way, the eighteenth century, together with part of the next, as represented by our Academical Philosophers, became an age of innocence, blissfully unaware of the real difficulties of human thought, and wondering with a placid smile of superiority at the eccentricities of past and present innovators. Well-disposed students doted on the plausible commonplaces of preceptors like Nic. Engelhard (Groningen 1728-

\* An older Dutch Newtonian, who showed experiments relating to the new theories in private, was Bern. Nieuwentijt (1654-1718), M.D. and alderman of Purmerend, a pupil of de Volder and Kranen, and as such an ardent Cartesian in his youth. Dislike of hypotheses, and love of experiment, as practised even by Senguerd, made him turn to the Latin works of English authors. Of his two chief works in Dutch, one, on the evidence from nature for the existence of a Deity, was translated into English, and largely borrowed from, it is said, both by Paley and Chateaubriand. The other, printed after his death, is a treatise on mathematical method in refutation of Spinoza.

65), Jo. Lulofs (Leyden 1742-68),\* Dion. van de Wijnpersse (Gron. 1752-69, Leyden 1769-1805), Jo. Fred. Hennert (Utrecht 1764-1804), Jo. Theod. Rossijn (Harderwijk 1765-75, Utrecht 1775-1815), Bern. Nieuhoff (Deventer 1775, Harderwijk 1775-1818), all men of learning and sense, but without the spirit of speculative enterprise. The savage disputes of old, between schoolmen and inquirers, had died out long ago. Instead of them, essays and dissertations found plenty of cultivated readers outside the Universities, and their writers were encouraged to stand up for religion and morality by promises of gold medals and fine type. There were the Society of Sciences at Haarlem, Teyler's Society in the same place, the Society for the Defence of Christianity at the Hague, the Stolpian Fund at Leyden, all established in the latter half of the century, and holding out their yearly prizes. Among their early laureates one of the most esteemed was the Mennonite preacher, Dr Allard Hulshoff (d. 1795), from the Wolfian school of Engelhard, and even professors like van de Wijnpersse and Dan. Wyttenbach, more celebrated as a philologist, were proud of their approval. Turning over the leaves of their stately quartos and octavos, we now vainly try to appreciate endless rehearsals, in wordy Latin or indifferent Dutch, of the same worn-out demonstrations. Surely the worthy prizemen's success must have been something like that of the redoubtable Father Provincial,† "*qui super duas disputationes strenue se habuit contra haereticos, et superdisputavit eos omnes, sed noluerunt ei credere ipsi infideles*".

In point of fact, I suspect the best men of that period to have shared Ruhnkenius's opinion: "*suavitatem fructumque philosophiae positum esse in ratione et forma, non in materia et argumento; quippe de cujus veritate omnia esse incerta*".‡ Even Franc. Hemsterhuis (1721-90), the professed Platonist, who despised Cicero as a philosopher, would have Philosophy entirely separated from Science, and told his readers that the human soul was designed to contemplate and to enjoy, and not, as it seemed, to understand its objects. In spite of a slight tinge of the doctrine of Spinoza, he draws the regulation dogmas of moderate eighteenth-century Deism from the depths of his inner consciousness, and for his much-admired speculations on love he is indebted, rather than to the *Symposium*, to his innocent flirt-

\* One of Lulofs's pupils was Elie Luzac the Wolfian, Doctor of Law and printer at Leyden, who wrote in French, besides other works, a refutation of Lamettrie's *L'Homme Machine*, entitled *L'Homme plus que Machine* (1748).

† *Epistt. Obscur. Viror.* I. 49.

‡ Wyttenbachii *Opuscula* I. p. 535, in Vita Ruhnkenii.

ings with Mesdames de Galitzin and Perrenot.\* Still the classical studies revived by his father Tiberius (1685-1766) had the good effect of discrediting the mock mathematical demonstrations of the Wolffian imitators. Also, the contemporary Scotch thinkers began to be noticed by men like Hennert†; and on the whole, by various influences, Philosophy in the Universities themselves was brought near to a level with polite literature. "Clearness and distinctness," a by-word ever since Descartes, assumed the meaning of plainest possible intelligibility. Only the language of the lecture-room remained Latin, though it rarely attained the accomplished elegance of Wytttenbach's *Præcepta Philosophiæ Logicæ* (Amst., 1781).

When Kant emerged into European celebrity, his works were received in these parts with more doubt than applause. Except for a rectorial oration of Ant. Chaudoir at Franeker (1792), and the lectures of Hennert and the young Ger. van der Voort at Groningen (1790-93), he was barely mentioned by the official men. At Amsterdam he met with an active apostle in Paulus van Hemert, formerly a professor at the Remonstrant Seminary, who published a couple of treatises (1792 and '96) and six volumes of a magazine (1799-1803), in which he was joined by a small number of rising talents. When their journal proved too heavy for its intended readers, van Hemert tried a more literary and popular one, which by his ready wit was kept alive for four years more. In those same years (1804-8) some of the best Groningen undergraduates carried on a junior Kantian Society. Provoked by the contemptuous treatment of received opinions and their timid advocates in the Amsterdam publication, van de Wijnperse in his extreme old age published some anonymous remarks on the dangerousness of the Critical doctrine (1805), and Wytttenbach (1807) attempted to ridicule the new metaphysical fever, upbraiding Kant for ignorance of history and van Hemert for neglect of Latin, discourteousness, and oblivion of personal benefits. A fierce literary war between the veteran with his school and the Kantian chief was kept up in Latin during the next seven years. After this, the movement, always limited to a small circle, slowly died out in the country. The last Kantian relic was an orthodox village clergyman named

\* As to the Platonic dialogues of Madame Wytttenbach, they are but clever exercises in French composition.

† Will. Laur. Brown, who died in 1830 as Principal of Marischal College at Aberdeen, was born at Utrecht in 1755, and officiated there as Professor of Moral Philosophy, etc., from 1788 to '94, using Hutcheson as a textbook. Beattie's *Elements of Moral Science* were translated under Hennert's auspices, and published in 1795. But the Scotch influence is visible, even in 1781, in the latter's *Aphorismi*.

le Roy, who persisted in considering his master the destroyer of Rationalism, as showing by his sceptical arguments the necessity of a supernatural revelation.

Napoleon, during his short occupation of the country (1810-13) was pleased to abolish two of its Universities, degrade Utrecht to the rank of an *école secondaire* (whatever that might mean), and incorporate Leyden and Groningen as *académies* with his comprehensive *Université de France*. As a consequence, the Faculty of Philosophy and Arts, once the nursery of unbogoted thought and general culture, was cut asunder on the new French plan into one of Science and another of Literature. After the downfall of the Empire, the Royal Decree of Aug. 2, 1815, on University Education, ratified this disruption, but introduced the titles of *Facultas Disciplinarum Mathematicarum et Physicarum* and *Facultas Philosophiæ Theoreticæ et Literarum Humaniorum*. In all the five faculties the degrees of Candidate and Doctor were to be obtainable by stated examinations; but students of Divinity or Law had first to take a special degree in Literature, and those of Medicine a similar one in Science. Besides, to keep up a connection between the great divisions of university-work, there was introduced an elaborate system of certificates of attendance on lectures in different faculties. For instance, while philologists were examined, everyone else had to produce his certificate in Logic; Metaphysics and History of Philosophy were examination-subjects for the literary doctorate, but the lectures must be attended by students in natural science and in theology as well. The whole form of education set forth in the new Decree was an ingenious compound of the old plan of a liberal education and the novel one of mere professional training; and in the course of sixty years it has proved a practical failure. First, the arrangement of Grammar Schools was for the most part left at the mercy of municipal authorities, under whose too often tradesman-like rule sound classical instruction was allowed to decline by degrees. From 1845 to '49 a Government Commission was appointed to examine for matriculation, and thus set up a fixed standard of proficiency; but this was soon discontinued, and matters were left to grow worse than ever. Seeing men admitted to the University from imperfect schools or scanty private tuition, parents began to think it a wise thing not to detain their boys in the higher forms of well-conducted establishments. The old custom of lecturing in Latin, sanctioned as a rule by the Decree of 1815, had to be abandoned, not so much because of modern notions as of deficient understanding of the language. A more serious disadvantage was the neglect of a thorough training of the mental faculties, owing in part to the multiplicity of subjects gradually introduced into

preparatory schools for the mistaken purpose of a many-sided instruction. Secondly, the literary *propaideia*, as it was called, at the University could not answer its aim because the same teaching had to serve for future philologists and for everyone else; also because the plan had been subsequently improved upon by a separate examination in mathematics. Undergraduates felt that only the very best of them could really satisfy the conditions of the system; and hastened to get rid of their mathematical and classical obligations anyhow.\* In the third place, certificates of attendance appeared to mark a subject as being of little importance, and it was hard to refuse them, especially where other duties rendered such attendance a positive burden, and many without their own fault were ill-prepared to derive a real benefit from what they were commanded to hear.

Under this system, philosophical teaching was naturally esteemed by most young men a kind of troublesome "survival" from the dark ages, and had moreover to be kept down to the level of intellects little accustomed to serious exertion. Of the four subjects mentioned in the Decree, Ethics was after a time left off as a useless duplicate of Moral Theology, and Metaphysics generally coalesced with History of Philosophy. Nor was there much chance of rivalry of opinions in the same place. For as the State was at the charge of maintaining three Universities,† there must needs be a limited number of chairs, and in one instance, at Utrecht, Philosophy was divided for some years between the professors of Mathematics and of Greek. Amsterdam, being a mere city Athenæum, trusted as of old to its physicist, until it happened to meet with an orientalist, Dr. Taco Roorda, much interested in philosophical studies;‡ and since he left the place in 1843, both branches of learning have been represented in combination by his three successors, now all employed as professors at Leyden, but of whom only one continues to teach Philosophy.

\* At Leyden, from Sept. 1876 to June '77 (the unit of University time always embracing a whole year), there were 118 examinations by the Literary Faculty, of men destined for the study of Law. Four of these passed their propaedeutical stage "*summa cum laude*," seventeen "*non sine laudibus*" sixty-three passed without comment, and thirty-four were plucked.

† Leyden, Utrecht, and Groningen. Moreover there were at first the State Athenæa of Harderwijk and Franeker, abolished in 1818 and '43.

‡ A paper of his, on the present condition of Philosophy in the Netherlands, appeared in I. H. Fichte's *Zeitschrift*, Vol. X. (1843). He wrote in Dutch on Psychology (in the German manner) and the Philosophy of Language. For the last thirty years of his life, he was the chief representative of Javanese philology.



In practice, lecturers on Logic had the option either to attract an audience by avoiding technicalities and by a plentiful sprinkling of literary condiments, or to stick to their subject and drive most of their hearers away. One of them, who tried to take a middle road between the two extremes, and to give some value to his certificates by a little private examination, found the outlines of Formal Logic looked up to as little short of the Differential Calculus. As for the Metaphysical course, it had to be sweetened with historical matter, and hardly left a vestige in the youthful mind beyond a few dates and ready-made formulæ. There was no time to give anything like a complete survey; anyone taking an interest in philosophical discussions felt extra time spent on them as detracted from his proper avocations. Also, Divinity professors took to giving parallel lectures under the title of Natural Theology; and for the sake of the philological students and their final examinations the best plan was after all to devote the one year that was available to an account of Greek philosophy from Thales to Aristotle.

Of the dozen or so of professors representing Philosophy during this last period, none became properly followers of the great contemporary German schools. It is true that the well-read Jac. Nieuwenhuis (Deventer 1816-22, Leyden 1822-43), after admiring Geo. Hermes of Bonn, took some part in recommending the views of Krause, as explained in French by Ahrens; also, the present titular at Utrecht was at one time their eloquent advocate. Again, the liberal Catholic, F. C. de Greuve (Groningen 1831-62), gave some evidence of a leaning towards Hegelianism. Others, like the lofty-minded Mart. des Amorie van der Hoeven (prof. of Law, Amsterdam 1848-68), were deeply impressed by the German speculations; but their allotted place was not in a philosophical chair.\* On the opposite side, divines like E. A. Borger† scornfully warned their countrymen from wasting their attention on those foggy and comfortless foreign productions; and even one of the old Kantian set of van Hemert, J. F. L. Schröder (Utrecht, 1817-44), turned out in his mature age to be an anthropologist of the common-sense and common-place school. A sound mathematician, a man of most extensive reading, and an earnest and amiable moralist, he held his own beside the popular Ph. W. van Heusde (Utrecht 1804-39), a pupil of Wytttenbach and an unceas-

\* For this reason I must also refrain from reporting on the original attempt of one of van Hemert's old comrades, Dr. J. Kinker (d. 1845), to complete the Kantian system in his *Essai sur le dualisme de la raison humaine*, published after his death in an unfinished state (1850-52).

† *Disputatio de Mysticismo*, Harlemi, 1819, Hagae Com., 1820.

ing expounder on the nature and history of Man, who inspired his hearers with an ardent love for Plato without penetrating very far into the depths of that master mind.\* After these, Utrecht had the good fortune to obtain the services of Dr. C. W. Opzoomer (1846). By his fluent and tasteful lecturing many have learnt to admire a form of doctrine derived in the main from Comte and J. S. Mill, but supplemented by a divorce between scientific and religious truth, so as to find room for a broad type of Protestantism. One of the leaders of the "Modern" party in the Church, he has also distinguished himself as a commentator on Dutch Civil Law, and as a careful student of Modern Literature. Like his two predecessors, he has earned the fame of a promoter of intellectual life far beyond his official sphere, and spokesman of a goodly number of our most cultivated men. From his school came forth the Chevalier van der Wijck, professor at Groningen since 1863, who appears to turn his attention chiefly to the propagation and improvement of modern British Psychology.

Outside of the Universities, various thinkers have found an echo in the country. From 1828 to '30, and again in '36 and '37, a Hegelian periodical was published at the Hague by a small body of believers. Among the material supporters of Comte there were certain military officers in the Dutch service, and more than once the Positivist doctrines, both original and as reformed according to M. Littré, were recommended to our notice. They even contrived to present themselves in the form of a dissertation for the degree of Doctor of Divinity.† Others again looked for their guidance to the systems of older ages. Dr. A. J. Vitringa made interest for the emanation-theory of Plotinus, and Dr. J. van Vloten devoted many years to the task of getting credit for our own Spinoza as the Philosopher of the Future.‡ A variety of heterodox opinions, from Deism to Se-

\* *Initia Philosophiae Platonicae* 1827-36, 2d ed., 1842. *Characterismi principum Philos. veterum* 1839. In his Dutch works, especially the *School of Socrates* (1834-9), of which there exists a German translation, he advises his countrymen, on the strength of a theory of national capabilities, to abstain from competition with others in the field of independent philosophical research, and study the ancients merely for their own edification. His tomb was inscribed with a sentence of his own: "How could he be called a philosopher who does not believe as a child?"

† Dr. l'Ange Huet, Leyden 1866.

‡ Of purely historical contributions, I need only mention the *Fragments of Xenophanes, Parmenides, and Empedocles*, edited (1830-38) by S. Karsten, the pupil and successor of van Heusde; the dissertation of his son H. T. Karsten, *de Platonis quae feruntur epistolis* (Traj. 1864), and the remarkable studies of the late P. A. S. van Limburg Brouwer on Indian and Chinese speculations, published in the *Gids* (Guide)

cularism, were advocated side by side in the volumes of the *Dageraad* (Dawn), a special journal appearing at Amsterdam for several years since 1856. Throughout our theological and general literature there are indications of a sincere interest in certain philosophical questions, much desultory reading about them, and a desire to have them answered to one's personal satisfaction. The self-contented "Eclectic" or "Christian Philosopher" of the last century, though still largely represented in the ranks of elderly clergymen and jurists, is now becoming a figure of the past. In his place, drawing-room free-thinkers would compound for a similar makeshift, the "Poet Philosopher," and their friends in the laboratory try to construct a creed out of the tentative assumptions of Science. But habits of scientific thoroughness, acquired by steady application to any class of problems, give rise to a demand for something of a quite different type. Where methodical research is attempted, it remains to be seen whether the rising generation will avoid the slough of sceptical despondency and find its way to rational convictions of its own.

From the first of October of this present year our Universities will be subjected to the Law of April 28, 1876, and the Royal Decrees appertaining thereto. The main feature of this law—considered by many to be a patched-up compromise between contradictory principles—appears to be an absolute division of labour. The Grammar School, or Gymnasium, as reformed within the next four years, is to be the place for liberal education, and to absorb all that went under the name of literary *propaïdeia*; whereas the University becomes the place for such professional training as requires some knowledge of Latin and Greek—a mere aggregate of special schools. Certificates of attendance are abolished altogether. The five Faculties remain as they were. Only that of Divinity is loosened from all connection with church or sect, leaving its former dogmatical and practical teaching to be pursued in ecclesiastical seminaries;\*

monthly magazine, and intended apparently to invalidate the vulgar conceptions of human nature and self-evident truth.

\* Institutions of this kind, mere schools without living in common, have been kept up for many years in close connection with the Athenaeum at Amsterdam, by the Remonstrants, Mennonites, and Lutherans. Nor are the scholarship and social status of their ministers in any sense inferior to those of the clergy turned out by the universities. There is no state church in this country since 1795; so legislation is but consistent in placing all denominations on the same footing. The present Remonstrant Professor of Divinity is established at Leyden, and without belonging to the University, took a share in its teaching as if appointed to an extraordinary chair. Under the new Law he is to hold office in the University as well, on the strength of his happening to be our one

and in those of Law, Natural Science, and Literature, men may follow different paths and obtain different degrees. Instead of one kind of *Philosophiae Theoreticae Magistri, Literarum Humaniorum Doctores*, as ordered in 1815, we are in one Faculty to have special Doctors of Classical, of Semitic, and of Dutch philology, of that of the East-Indian Archipelago, and of Philosophy. The latter will be different from anything yet known in history. A young man of eighteen, fresh from his Gymnasium, is to be instructed in Logic, Psychology, and the history of Greek and Roman Philosophy, and then to take the degree of Candidate. By another examination, concerning Mediaeval and Modern systems, and Metaphysics, "in its full extent and all its applications," together with a dissertation to be argued on for an hour, he may conquer the title of a Doctor, and afterwards—repent of his neglected education. Certainly such a scheme did not come into being through any oversight on the part of those who will have to carry it out. The only chance of counterbalancing its evil effects would be in a combination of the Philosophical with some other curriculum; provided one could afford to stay for a couple of years beyond the usual time. Philosophy being thus pushed aside into a corner of the academical system, should try to get a voluntary hearing from the best students of every class; but then there is the difficulty of finding suitable hours, and procuring due consideration for intricate problems without the inducement of some present reward. The student of Classical Literature alone will be obliged to acquire some notion of Ancient Philosophy for the sake of his first degree. Perhaps the cause of independent thought will be best served by carefully written books for private reading. Philosophy at large can dispense with Universities, but Universities that try to dispense with Philosophy will be found in the long run to tamper with the mainspring of their own constitution.

J. P. N. LAND.

*Leyden, August, 1877.*

specialist in the History of Religions. Among the old philological and philosophical professors of the same denomination were Jo. Clericus (le Clerc, 1684-1736), the friend of Locke, Dan. Wytttenbach (1771-79), and Paulus van Hemert (1790-96).

## VII.—CRITICAL NOTICES.

*Des Sociétés Animales : Étude de Psychologie Comparée.* Thèse soutenue devant la Faculté des Lettres de Paris. Par ALFRED ESPINAS, Professeur de Philosophie au Lycée de Dijon. Paris : Germer Baillière, 1877.

M. Espinas takes possession, in the name of a new science, of ground that is all but unoccupied. The study of the social ways of animals has not indeed been neglected, and in the case of many species has been pursued by skilled observers. But it has been treated mainly as an appendix to Natural History, and in the spirit of that method. The movement which has converted this tract of knowledge into a fruitful field of speculation has derived its impulse from two very different quarters. The foundation of a Social Science almost under our eyes has taught us what to look for in the lower forms of social life. But it is chiefly to the discovery of the organic connection between man and the non-human animals that the subject owes a scientific status. Mr. Darwin has himself applied his principles of Natural Selection and Sexual Selection to the elucidation of many of its phenomena. M. Houzeau has in various relations exhibited the continuity between animal and human societies. Signor Zannetti has compared the animal and human forms of the family, with the view of educing the laws which govern both. And Mr. Spencer, while ostensibly dismissing the subject as having only a preliminary interest, has vindicated its importance by devoting an entire division of his *Principles of Sociology* to establishing the analogy between the social organism and animal organisation. M. Espinas is under obligations to several of his predecessors, especially to Mr. Darwin and Mr. Spencer; but his conception of the subject is his own. Widening it at the lower extremity so as to take in the lowest animal existences, and tracing without a break the lines of connection between these and the highest mammals, he has aimed at constituting this branch of inquiry into a homogeneous whole, with defined limits and a peculiar province, which may fitly be named Animal Sociology.

Comte has somewhere speculated on the reasons why man alone of all the animals has succeeded in forming societies. As a matter of fact, there is no animal that has not formed societies, which are proportionate—excepting among the more predatory species—in point of size, complexity, and compactness, to its rank in the scale of nature. No living being, says M. Espinas, is alone. From the lowest to the highest, all the animals are to be found, at some moment of their existence, sharing a common life. We may even see reason to conclude that, so far from association being the flower and crown of the animal kingdom, society is the primary fact, and families and individuals secondary and tertiary—that societies are not “formed out of aggregations of families,” and families out of

groups of individuals, but that families and individuals are specialisations of societies and have been developed within them. Sir H. Maine has exhibited a time when individuals did not (in a sociological sense) exist, and families were the units of the State, while Mr. McLennan's remarkable inductions carry us back to a remoter period when families were not yet distinguished within the tribe and the tribe was all-in-all. M. Espinas's researches seem to furnish a basis for theories which have still a certain character of empiricism, by unfolding a far more distant epoch when in a physiological sense the individual did not yet exist, and when the animal organism was an 'undifferentiated' mass which contained within itself the germs at once of family and individual.

Societies are normal or abnormal. They are normal when formed by animals of the same species which cannot live independently of one another. They are abnormal when formed by animals of unlike species which live together rather from convenience than by necessity. M. Espinas begins with the latter, which fall into three groups. *Parasitism* is an enforced association in which a smaller animal lives attached to the body of a larger and preys upon that. It is the antipodes of the social life, since it degrades both parasite and prey; its sociological significance is that it is a prolongation of the struggle for existence sustained against superior new species by the inferior ones already in possession of the earth. Resembling the chase in its lower forms, in its higher it approaches the second group. *Commensalism* occurs when an animal lives on the remains of another's meals. Both groups lack the essential elements of society, but their discussion may be defended on the ground that they are not without analogies in human societies, and because they shade off insensibly into the third group, with which real association begins. When animals of similar habits come together in similar circumstances, voluntary amicable relations never fail to arise between those species which have nothing to fear from one another and have the same enemies. As they render one another services, this mode of union has been named *Mutualism*. Its lower forms are well known, and we pass at once to the highest of all. Domestication is not indeed a voluntary association at the outset; but its success and its continuance rest on a powerful hereditary tendency which is found in the free state among all the animals that have been domesticated—the instinct of voluntary subordination to the stronger and more intelligent. The early emergence of this instinct is deservedly signalised by the author, because it is the chief basis of even human government, which, if it rests partly on the possession of force by rulers, rests yet more on the willing submission of the ruled. As felt by one animal for another of the same species, it is comparatively primitive: so far down does hero-worship go. As felt by animals for man, it is obviously acquired, and M. Espinas speculates ingeniously on the mode of its acquisition. He produces facts which suggest that man acquires dominion over a herd of animals by living their life and thus becoming half an animal himself, and in virtue of his superiority taking the place of the

natural head of the troop. Such conquests are in a single known instance made by one animal over another of a different species. It is the less surprising that they should occur among ants because, as Sir J. Lubbock has recently contended, the disproportionately large brain and developed social ways of the ant give it a plausible claim to rank next to man. The characteristic facts are that ants of certain species rear in their nests the pupæ of other species, that the latter perform duties which have caused them to be denominated slaves, and that this practice is continued from generation to generation. In seeking to explain the instinct which a practice so transmitted implies, M. Espinas comes upon the latent controversy which divides the evolutionists. It is not always easy to reconcile Mr. Darwin's different statements, but his view may be taken to be that the mental faculties throughout the animal kingdom have been acquired and perfected mainly by natural selection. Mr. Spencer, on the contrary, is understood to ascribe organic development in a great degree, and mental evolution wholly, to inherited increase of function produced by the continued exercise of an organ adapting itself to surrounding conditions. In dealing with the problem before us, as well as generally, M. Espinas rather pointedly rejects Mr. Darwin's solutions, and accepts, though not avowedly and with the omission of essential parts of it, the doctrine of Adaptation.

His criticisms on the application of the theory of Selection need not detain us. One of them has been answered in anticipation by Mr. Darwin, another by the author himself at a later stage, and a third seems to rest on a misconception of the theory. Still it may be admitted that the attempts of Darwinians to explain the origin of the mental powers have been more hypothetical than demonstrative, and it may be doubted whether success is possible until the theory becomes more specific. At all events the field is open for alternative explanations. In opposition to what he would doubtless style physical hypotheses, M. Espinas propounds "*une tentative d'explication psychologique*". The gist of it is that animals of a certain degree of intelligence perform, from an excess of energy, (this must be the assumption) a large number of experimental actions *pour voir*—'out of curiosity,' that the ant possesses this degree of intelligence, and that the actions by which the ant acquires and domesticates slaves are a series of such experiments, each of which demands but small power of adaptation, but which culminate in the acts characteristic of domestication. The criticisms that the amount of energy possessed by inferior organisms is rarely in excess of their absolute needs, and that curiosity is not a characteristic of the lower intelligences, might be accentuated if the defects of the hypothesis were not more serious. M. Espinas apparently does not (at least at this point—he does afterwards) see that new powers are acquired only under pressure of some necessity, and that this is as essential a part of Mr. Spencer's as of Mr. Darwin's theory; and he accordingly fails to state what are the new conditions to which the ant must adapt itself, or what advantage it gains by so doing. It is an equally fatal objection that he altogether omits the element of



inheritance, so that he is obliged to assume that successive generations of ants go through the same processes in the same order without any organic tendency thus to repeat them. This is no accidental omission of an element which has only to be added to make the hypothesis a sound one. It is a consequence of the theory of adaptation, according to which the instincts of neuter ants must have been acquired by these ants performing new actions which gave rise to new nervous connections; but as neuters leave no offspring, the new nervous structures cannot have been inherited. The way in which the principle of selection enables Mr. Darwin to get over this difficulty may be the true solution of the problem, or it may be only a speculative *tour de force*, but it must be acknowledged that however probable the doctrine of adaptation may appear—and its probability increases as we ascend the scale, though Mr. Romanes's recent experiments show that it is applicable as far down as animals with only the rudiments of a nervous system—it has peculiar obstacles to encounter in seeking to explain the facts of instinct in ants.

In passing to normal societies we are met by the question—what are the limits of the Social Science? Assuming (and the assumption can be better justified by results than by reasoning) that associations of animals fall within them, how far down the animal scale are we to go? At the bottom of it are to be found individuals which are each "a minute group of living molecules or physiological units". Are such associations to be regarded as societies? and is the individual itself a society? M. Espinas rests an affirmative conclusion mainly on the ground that our notions of individuality are narrower than the facts, that the individual is variable and individuality relative, and that the so-called individuals are really groups of individuals of a lower order. It is a perfectly valid argument, but the inclusion of such groups will be best vindicated if they are shown to be regulated by laws similar to those which regulate the admittedly social groups. Again, if such animal forms are societies, are not plants societies too? M. Espinas admits that this may one day be shown, and that the study of them in this relation will then become a part of the Social Science; but it would seem that the fact has been already demonstrated. And lastly, to drive the wedge home, if animals and plants are societies, are not masses of inorganic matter also societies? It does not seem conclusive to reply with the author that the latter are not living beings, when every day the division between living and not-living is becoming fainter. From nations to nebulae, from the ordered dance of the atoms to the most spiritual relations which bind man to man, there is nowhere any such breach of continuity that we can say, on this side of the line there are associations which we can call societies, and on the other aggregations which are something quite different. Stretched to this extent the word society loses its meaning, and there is some reason for agreeing with those who confine it to human associations, and who describe inquiries into pre-human aggregates as Pre-sociology. But the study of the higher aggregates will be empirical unless it is based on that of the lower, and it is probable that we shall have not

one or two but a series of sciences dealing with the successive groups. Each of these will demand a distinct order of inquirers—physical, chemical, biological, and sociological, each acquainted with the results reached by the others, and when some approach to completeness has been made, and the gulf which separates the different sciences has been bridged, we may have a single science dealing with the whole range of the phenomena.

In the meantime we must follow M. Espinas, who begins with associations of biological units, or, as he names them, Societies of Nutrition. Nutritive societies are so-called because the end which their associated existence subserves is the nutrition of the individuals composing them. This which is the final cause of the earliest and simplest associations, remains the basis of the highest and latest. As we rise from Nutritive to Reproductive, and from Reproductive to Relational Societies, it indeed becomes more and more subordinated, as the relations among the individuals become less and less material. But it never ceases to be the foundation of even human association, and it is from this root that all other ends and relations—even the most spiritual—have grown. Societies which are solely nutritive have this character in common that the individuals composing them have been attached to one another from their birth and have never lived isolated: societies are primary. They fall into two classes. (1) Those without vascular communication, as the various orders of Infusoria. They are formed by segmentation: the parent mother-cell splits into a considerable number of cells which remain connected with one another, among the lower orders by simple juxtaposition, among the higher by an organic bond of a simple kind. The social unity of such groups is still feeble: their co-operation is hardly discernible. The individuality of the parts, which is in direct proportion to the unity of the whole, is equally feeble. The causes of such groupings have still to be discovered, but it may be assumed, in accordance with the theory of selection, that individuals so feeble have survived in virtue of their association. (2) Societies with vascular communication, comprising Polypes, Molluscs, &c. The form of association exhibited by these is constituted by the grouping of individuals which are united not only by the juxtaposition of their elements and the connection of their tissues (as in the case of animals without vascular communication), but even more by the permanent junction of their cavities. The true "social bond" is consequently, according to M. Espinas, the liquid which passes from one to another, and maintains the supply of nutritive elements. They are so arranged by M. Espinas as to exhibit successively higher degrees of the division of labour and organic cohesion, and the gradual formation of a nervous system, or its rudiments, with corresponding functions. In the later stages these combined processes result in the formation of a so-called individual (as M. Espinas would say, a collective individuality) or social unit. The important thing to be noted is that the organs and offices which we name social institutions and functions are already discernible in the parts composing the

individual. How the composite individual subsequently develops in converse with other such individuals activities like those going on within itself is a problem which touches the roots of Social Science.

Animal associations which have nutrition for their object give rise by a slow and gradual transition to associations for the purpose of Reproduction. The connection of parts which is life-long in the earlier forms tends to dissolve; the communication of the individuals is momentary and often renewed instead of being lasting; and the individuals begin to lead independent lives. This separation takes place in close parallelism with the rise of sexual organs, which is again explained as a development of the division of labour. Their tendency to unite is accounted for by the fact that they are the descendants of individuals which were in permanent organic union, and are thus divided halves which are necessary to one another's existence and constitute a whole when united. If we might assume as prevailing among animals nutritively associated something corresponding to the instinct of self-preservation, then the sexual instinct might be explained as a modification of that primitive instinct. But M. Espinas is convinced that the physical explanation accounts only for the origin of the appetite, and that its maintenance depends upon certain "psychological bonds". These consist in manifestations of an æsthetic kind addressed by the male to the female, which may be arranged in the order of their decreasing materiality—caresses, odorous emanations, displays of colour and form (or costume), song, and lastly motions, at first simple but becoming more and more combined. Answering to these powers of expression, there must be in the female corresponding faculties of appreciation—more or less subtle senses, which have been at least developed by means of sexual selection. That they were also so originated even M. Espinas (who usually shies at Darwinism) inclines to conclude; but if (as seems to be the case) many of these manifestations are only the more ordered exercise of functions necessary for subsistence, their origin might be better elucidated by an expansion of the theory by which Mr. Spencer has explained the acquisition of the musical faculties.

The union of male and female is the first stage in the constitution of the Family. The second is the association of parents and offspring. Analogous to the fact which we meet with in human societies, that it is the relationship of children to mothers which is alone primitively recognised, it appears that the first form of this association is that of the mother and her offspring: it is only in the higher societies that the male becomes a permanent member of the family. A physical explanation is here, as everywhere, to be given. The offspring are at first but a continuation of the bodies of their parents, as colonies of cells were originally part of the parent cell, but the female remains longer physically attached to her offspring than the male. It is on this basis that M. Espinas explains the origin of the maternal affection: love of offspring is love of an "extended self". By successive developments and specialisations of this instinct the family gains an increasing unity in time and space. Under its auspices industry arises,

from the necessity of preparing a shelter for the young: perhaps it would be more exact to say that it has two origins, the other being the procuring of food. Property arises out of industry, but only out of the two-fold form of it just mentioned. The accession of the male marks a new phase in the growth of the family. At first he plays a preponderant part, just as in barbarous societies kinship *solely* through males is substituted for kinship through females. The paternal affection springs up in the same way as the maternal. It is first observable in fishes, the males of which fecundate the eggs. They are thus veritably part of his own body, and are cared for as such: *paternal* love of offspring is also love of a prolonged self. What here wants explanation is the exclusion of the female from the care of the young. Subsequent developments of the paternal instinct (as in birds) M. Espinas explains as due to the desire for domination and the love of property (both specialisations of the instinct of self-preservation), but it is probable that the organic affection to which it owes its origin is never afterwards quite absent. Organised by this instinct the family attains still greater complexity and compactness, and prepares the way for associations of a higher type.

The Tribe has been until lately supposed to be a development of the family. It is not the least of M. Espinas's services to Sociology that he takes away the bottom from this theory. He clearly shows that where the family has acquired a high degree of unity (as among birds) the formation of a tribe rarely happens. On the contrary, hordes usually arise where promiscuity or polygamy prevails, as among the less predatory mammals. The full-grown family and the tribe are mutually hostile. No explanation of this is attempted, but it appears to be a law of nature that instincts have to be developed to excess before they are fitted to play a simply co-ordinate part. The maternal affection at first acts alone, reaches a high pitch, and then disappears for a time; the paternal affection at first alone operates and carries the organisation of the family to a point incompatible with a collective existence; then the instinct of sympathy, which had been leading an embryonic life, definitely emerges, and forms the tribe. We cannot follow M. Espinas in his analysis of this affection, but in no part of the work is his psychology more original or more suggestive.

In a closing chapter the author sums up the results of his inquiries in a number of "laws," necessarily of a rather vague character, descriptive of the nature, origin, development, and duration of animal societies. The conclusion that a society is a living organism, which has progressed from a state in which the relations among its members were physiological to one in which they are psychological, may be taken as approximately true, with the qualifications that the terms 'living' and 'organism' have connotations of a somewhat lower order than the facts, and that while the relations are slightly psychical from the outset they remain partly physical to the end. Most instructive applications of this general result to the theories of mind and morals conclude the work.

Even the foregoing rapid analysis may have served to show that M.

Espinas's volume is one of first-rate importance as a contribution both to social and mental science. Large and original in design, the execution of it may be said to be worthy of the plan. It is not indeed without defects : theories are started only to be dropped ; hypotheses are laid down in one chapter and thrown over in another ; and objections (as for example to Natural Selection) are repeatedly made throughout the work and repeatedly refuted in other parts of it. But these and similar inconsistencies may perhaps be ascribed to the circumstances under which the essay was produced and the restraints of the author's official position.

J. COLLIER.

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*Logische Studien.* Ein Beitrag zur Neubegründung der Formalen Logik und der Erkenntnisstheorie, von F. A. LANGE. Iserlohn : J. Baedeker, 1877.

This posthumous fragment is worthy, both in matter and style, of the author of the *History of Materialism*. The Editor, H. Cohen, tells us that it was completed three weeks before its author's death, but that it was begun before the preparation of the second edition of the *History* ; and he remarks that its main principles are those which permeate Lange's Philosophy, and that accordingly the friends of the *History of Materialism* may take it as the exponent of the historical critic's systematic views. With these remarks we fully concur. It is an invaluable key to the *History*, especially to the most interesting part of it which deals with Kant and his influence.

The gist of the book is to show that the intuition of Space is the source of the *apodeictic* not in Mathematics only, as Kant held, but in Logic also. This is shown, first, by an appeal in detail to what we are conscious of in our own minds when we engage in the processes of Formal Logic ; and, afterwards, by entering into what we may call the metaphysic of Space. The elegance with which these two portions of the present work are connected is very characteristic of Lange, in whom metaphysic always holds its legitimate place of style in relation to matter.

The work begins with a criticism of the *apodeictic* in the ordinary Metaphysic. The fact that metaphysicians are not agreed, proves that we must not look for the *apodeictic* in their various systems, for the *apodeictic* is self-evident and beyond dispute. The metaphysicians have had it so much their own way since Aristotle's time that the mere *form* of deduction has come to be identified with the *apodeictic*, however disputed in each system the principles may be and the conclusions derived from them. The professor of a systematic metaphysic thus elevates himself above the man of science to whom he denies the *apodeictic*. It is the object of Lange in the present work to vindicate against this professorial *apodeictic* that of *μαθηματικὴ ἀκριβολογία*. He might, we think, have made out even a stronger case than he has done against the systematic metaphysicians. He accuses them of holding Aristotle's theory of *ἐπιστήμη* in an age when

it is no longer merely *naïf* to do so. But it is surely true that they have perverted the theory by giving an extended sense to *ἐπιστήμη*, which Aristotle practically limits to mathematics. We do not wish to be thought ungrateful to a book so full of suggestions as the present; but we cannot help expressing our regret that it does not go into the subject of Aristotle's theory of the method of geometry. His theory, which has not received the attention which it deserves from his commentators, interesting independently, seems to us to gain a special interest when viewed in connection with Lange's remarks on Formal Logic, of which Aristotle is the author. But before attempting to supply this omission, we must state Lange's view of the nature of the apodeictic in Formal Logic, and his criticism of Aristotle's view on the subject.

Kant showed that mathematical judgments are synthetic *à priori*, but maintained that logical propositions are analytic, implying the Principle of Contradiction. But all apodeictic truths are synthetic. Mathematical truths are syntheses *à priori* by means of the intuition or perception of Space. Logical truths are syntheses *à priori* by means of the same intuition (pp. 8, 9). As the necessary deductions of mathematics are derived by the way of self-evident sight from the immediate perception of the simplest geometrical shapes, into which the less simple diagrams are broken up—these simplest shapes being, as Kant expressed it, perceived in pure intuition; as Dugald Stewart expressed it, hypotheses; as Lange expresses it, variable in imagination within the limits of a notion (pp. 22, 28, 47),—so, too, the processes of Formal Logic derive their necessity from the perception of figures in Space which are immediately seen to include totally or partially or to exclude other figures. This immediate perception is the only ground of the apodeictic. Even the Principle of Contradiction itself reposes on this ground, and its mechanical employment in Reduction must not be allowed to mislead us as to the ultimate ground of the apodeictic in that process (pp. 26, 27). Similarly we can manipulate numbers mechanically in counting (p. 21); but the small numbers which are our *ἀρχαί* in arithmetic are originally given in space-intuition (p. 141). Aristotle's logic is, however, essentially one of intension—*τὸ Α κατηγορεῖται κατὰ τοῦ Β*. But this comes from his metaphysic. *A* is of the *essence* of *B*. The modern friends of the Aristotelian metaphysic who regard it as the 'apodeictic science' *par excellence*, attempt to exhibit it as the ground of the apodeictic in his logic also. But although doubtless in Aristotle metaphysical forms enter largely into logic, yet there is a marked difference, ignored by his modern followers, between his *Technik* and his *Erkenntnisstheorie*. Although the metaphysical theories of essence and of *ἐννύμια* and *ἐνέργεια* play an important part in his analytic, and although his logic may be therefore styled one of intension, yet he does not ground its necessity on metaphysical principles but on the exhibition of the extent of notions—*i.e.*, on the intuition of Space. Hence his logic has a value quite independent of that of his metaphysic (pp. 10, 17).

The Syllogism, Lange points out, obliges Aristotle to abandon the metaphysical theory of intension in favour of that of extension. Instead of τὸ Α κατηγορεῖται κατὰ τοῦ Β we have ἐν ὅλῳ τῷ μέσῳ κ. τ. λ., where the apodeictic is evidently based upon the immediate perception of circles or some such representative figures. He gives no *proof* of the First Mood of the First Figure. He regards it as self-evident that if C is wholly in B and B wholly in A, then C is wholly in A (p. 21). This substitution of extension for intension noticed by Lange in Aristotle may be paralleled in Mansel's *Prolegomena Logica*. When treating of judgment, Mansel takes an attributive view of predication, but the *dictum de omni et nullo* afterwards obliges him to interpret propositions in extension. It would be going too far however, Lange admits, to suppose that Aristotle consciously recognised in spacial representations the ground of the necessity of the moods of the First Figure. But it is significant that he considered them the most perfect moods and reduced the others to them. Even in his theory of predication, however, Lange finds evidences of space-intuition. Circle S is moved into circle P on Lange's theory. Aristotle moves P to S—ἐλγ is actualised in an individual (p. 11). This reconciliation is far-fetched, we think. There is little analogy between movement in space and 'movement' from potentiality to actuality. The Aristotelian theory of predication, as such, cannot, we think, be represented by figures in space; it is only when the proposition becomes the premiss, or when he converts it, that Aristotle interprets it in extension—as Ueberweg (*Logik*, § 84) remarks: "The possibility of making the predicate substantive is a tacit pre-supposition (in conversion) but is not farther discussed". To "make the predicate substantive" is to view it as a class of things occupying a definite space. But Aristotle did not realise the fundamental importance of this view to Logic as an apodeictic system; though it unconsciously dominates his *Technik*.

Lange, however, does some injustice to Aristotle in ascribing his reading of predication in intension entirely to his metaphysical pre-suppositions. Aristotle's theory of predication was really a protest against metaphysic or the dominion of mere words. Because Antisthenes the Cynic believed that every word stood for a thing or substance, and that one substance could not pass into or become another substance, he denied entirely the possibility of predication; and for exactly the same reason Plato, who wished to show the possibility of predication, had recourse to his myth of the μέθεξις of the individual in the separate essence of the Idea. That the doctrine of Ideas was closely connected with the difficulty about predication is a view supported by the fact that Antisthenes and Plato were bitterly opposed, and that the former wrote a work called Σάθων ἢ περὶ τοῦ ἀντιλέγειν against the Ideas. (See Mullach, *Fragm.* Vol. II., pp. 270, 282.) In the *Metaphysics*, Aristotle can scarcely be said to have seized the altered point of view regarding predication necessary to an effective criticism of the Ideas. Μέθεξις merely becomes the passage from εὐνομία to ἐνέργεια. The difficulty is antedated but not removed.



But in the *Categories*—whether or not the version we have is directly Aristotle's, does not make much difference here, we think—a new point of view is gained: the Noun is distinguished from the Adjective. 'Man' looks like a noun, but is really an adjective. It is an aspect of 'this man': ἐπὶ δὲ τῶν δευτέρων οὐσιῶν φαίνεται μὲν ὁμοίως τῷ σχήματι τῆς προσηγορίας τὸδε τι σημαίνειν, ὅταν εἴπῃ ἄνθρωπος ἢ ζῶον· οὐ μὴν γε ἀληθές· ἀλλὰ μᾶλλον πῶσόν τι σημαίνει (*Cat.* 3). 'Man' is an adjectival noun or common term connoting attributes and denoting individuals, and as such it is distinguished by him in this passage from a simple adjective like 'white' which has merely connotation. Even in the *Metaphysics* this point of view seems to be seized in at least one passage—*Met.* vi. 14: ἰδέαι ἅπαντα ἐξ ὧν ἄνθρωπος—all the various aspects or qualities of man will, on Plato's theory, be separate Ideas. The importance of the Aristotelian theory of *Categories* then is that it draws once for all a distinction destructive of the Platonic and many other word-mythologies.

We have thus attempted to trace the history of the Aristotelian theory of predication as attribution in order to substantiate our remark that Lange is not quite fair to Aristotle when he connects that theory entirely with his metaphysical pre-suppositions. Aristotle's new theory of predication was a most important advance in the struggling science of Grammar, or the art of clear thinking. It was a contribution to the possessions of the human race quite as valuable as his *Technik*; and so far, we can only admire the inconsistencies which Lange has pointed out in the Aristotelian logic. With regard, however, to the undoubtedly metaphysical elements in Aristotle's logic, Lange's remarks are, we think, most valuable. Aristotle's great error, he says (p. 33), was to transfer subjective elements to things—e.g., Possibility and Necessity, and in this way his formal *Technik* was seriously affected. With regard to Possibility—we can now say that the sight of the acorn suggests the *thought* of the oak; but the thought does not alter the acorn which is still an acorn (p. 37). We can dispense with the category of Possibility. But Aristotle's conceptions are destroyed by being explained in modern phraseology. His *Weltanschauung* was entirely different from ours. We, believing in the necessity of natural causes, may explain the *δύναμις* as "some of the conditions of a thing" and the subjective uncertainty of its actual development. But this was not Aristotle's view (pp. 38, 39).

Again, (p. 84) his view that the μέσον ought to be the 'real cause' is a piece of Platonism. He ranked Induction so low that he did not see the scientific importance of the conclusions of the Third Figure, and gave an inferior place to συλλογισμοὶ ἐξ εἰκότων καὶ σημείων. But modern discoveries have almost universally been made by *media* which have not been the 'real causes' (p. 89). Even mathematical proof in many cases does not take the 'real cause'—e.g., where the method is apagogic, or where one construction is preferred to another merely on account of its greater clearness (p. 90). With regard to these *Hilfsconstructionen*, we may say in passing that we think Lange is

scarcely correct in calling them *media* at all. They are merely conventional mechanical ways of breaking up difficult diagrams into their simple spacial elements. These elements are our *media* or *ἄρχαι*. Our conclusions are the development of their assumed or seen properties, and they may correctly be described as the 'real causes' of these conclusions. However, notwithstanding his theory of the 'real cause,' Aristotle, as Lange well points out (pp. 85, 86), gives few examples of syllogisms in which the *μέσον* is the 'real cause,' and yet his examples are formally correct. Here again his *Technik* asserts itself as something distinct from his metaphysic. The intuition of Space then is the ground even of ancient Logic; and modern Logic, with the same ground consciously or unconsciously taken, develops itself in two—we in England may suppose—opposite directions. Figures in Space necessitate the view of the universal as a *collection* of resembling individuals. The Aristotelian *τίς* which is distributive has given place to the modern *some* or *at least some*, (pp. 70, 72) which is collective. Thus the logic of Figures in Space connects itself with modern Induction. It also exhibits Logic as deriving its apodeictic character from the only fountain of the apodeictic—the intuition of Space, and thus makes it an integral part of the new Kantianism.

We must pass over, with bare mention, many interesting points of detail raised in the *Logische Studien*—e.g., the practical value of the different Syllogistic Figures (pp. 80, 81); the proof by diagrams of conclusions not allowed by the Aristotelian Logic (p. 83); the relation of the Particular Judgment to Induction (p. 57); that the apodeictic judgment is not more necessary than the assertory (pp. 41, 92); that contrary opposition is extralogical (p. 107); on the 'intuitions' of the Logic of Probabilities—coins, dice, balls—which give it its apodeictic character (p. 114). We must pass over these and other points, and proceed to give our reasons for believing that the derivation of the apodeictic from the intuition of Space was not so strange to Aristotle's mind as to exclude the likelihood of his having consciously based some part of his *Technik* upon it. We must remember that Aristotle was the *inventor* of Formal Logic, and was therefore more likely than Kant, who received it by tradition, to understand the real ground of its necessity.

The geometer's *ἄρχαι* according to Aristotle are the simple figures, e.g., triangle, (*An. Post.* ii. 7.) the definitions of which he assumes. These figures are *δι' ἀφαιρέσεως*—abstract, and their real nature is comprehended at a glance—*τὸ τί ἐστίν οὐκ ἄδηλον* (*Eth.* vi. 8, 6). In *Met.* ii. 3 he derives the necessity of mathematical proof from the abstractness of its objects—i.e., from their plainness at first sight: *τὴν δ' ἀκριβολογίαν τὴν μαθηματικὴν οὐκ ἐν ἀπασιν ἀπαιτητέον, ἀλλ' ἐν τοῖς μὴ ἔχουσιν ἕλην*. Geometrical proof consists in breaking up a difficult diagram into simple figures, the spacial properties of which we can take in at a glance—in drawing lines which enable us to see the demonstration. *Met.* viii. 9: *εὕρισκται δὲ καὶ τὰ διαγράμματα ἐνεργείᾳ. διατρούντες γὰρ εὕρισκουσιν· εἰ δ' ἦν διηρημένα, φανερὰ ἂν ᾗν*.

νῦν δ' ἐνυπάρχει δυνάμει. διὰ τί ἐνὸς ὁρθαὶ τὸ τρίγωνον; (Eucl. i. Prop. 32.) ὅτι αἱ περὶ μίαν στιγμὴν γωνίαι ἴσαι ἐνὸς ὁρθαῖς. εἰ οὖν ἀνῆκτο ἡ περὶ τὴν πλευρὰν ἰδόντι ἂν ᾗν εἰθὺς δῆλον. The geometer's circle is seen or imagined by him as it really is, and is therefore the essential source of his necessary demonstrations of its properties—τὸ κύκλῳ εἶναι καὶ κύκλος τὸ αὐτό (*Met.* vi. 10). If we remember that Geometry was to Aristotle *the ἀπόδειξις par excellence*, and that the ἀρχή or simple figure seen or imagined is seen or imagined in its naked essence, his theory of the 'real cause' in ἀπόδειξις will not appear so metaphysical as Lange represents it to be. Mathematical truths then according to Aristotle derive their universality and necessity from the plainness with which we can imagine the elementary figures always in exactly the same way. His theory is that afterwards advanced by Dugald Stewart; and it does not seem to differ essentially from Kant's. Kant's 'pure intuition'—perhaps too severely criticised by Lange (pp. 132, 3)—is after all a name for the power we have of imagining perfectly regular figures. As Lange indeed admits—Kant seems to include Imagination under Intuition, and it is through Imagination that the theorems of geometry and logic obtain their necessary character (p. 131).

Space then is the source of the *à priori*, and whatever science can be connected even by conventional and arbitrary assumption with Space-intuitions, becomes apodeictic. Formal Logic deals with objects generally, Geometry with the shapes and sizes of objects, and Arithmetic with the sums of equal objects. Time is derived from the perception of movement in Space (p. 147). Here the theory might be supposed to end naturally. But it is in Lange's manner to give his reader the metaphysical sensation of a wide and solemn prospect from the scientific eminence to which he has conducted him. Why is Space the fountain of the Apodeictic? Because it is the intuitional form of my Ego (pp. 137, 8). The ego which by association of ideas connects itself with my bodily states is not the ego of knowledge—the subject to all objects, my bodily self among the rest. There is an empirical distinction between the bodily self and the so-called outer world; but this merely empirical distinction has been transferred by a confusion of thought to the absolute ego, the subject which is never object, which is thus distinguished from the non-ego. Thus to distinguish it is to enter upon the path of baseless speculation. The only content of the absolute ego—the subjective pole of Knowledge—is the great totality of the World as perceived in Space (p. 138); for this transcendental ego (p. 148) is nothing but the entirely unknown counterpole of objective perception. The bodily self is one of its objects in the world of appearances which is our experience and our all. But as the empirical or bodily self is developed, great part of experience is opposed as something foreign and external to what we suppose to be ourselves—the bodily self. Thus Space also becomes apparently foreign and external to us; and yet it is the norm of the operations of the understanding, which on account of their universality and necessity must be determined by the constitu-

tion of the Subject. Kant (pp. 135, 6) held that Synthesis—the unity of the manifold—comes from the Subject. But it may well be that it is through this Synthesis that the empirical and conscious Subject first emerges, and with it necessarily also the Object of its consciousness. In the perception of Space we have the archetype of this fundamental Synthesis. Hence it is through it alone that all syntheses are possible. We cannot explain this unity of the manifold, but we can *see* it represented in Space. Here we feel the secret of Lange's style. A technical discussion brings us upon what we ventured to call a wide and solemn prospect. To think that the measureless space which I see is the archetype of myself! A shudder runs through the literary nervous system not unlike that which runs through the physical when one looks over a precipice.

J. A. STEWART.

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*Modern Philosophy from Descartes to Schopenhauer and Hartmann.*

By FRANCIS BOWEN, A.M., Alford Professor of Natural Religion and Moral Philosophy in Harvard College. London: Sampson Low & Co., 1877.

PROF. BOWEN says, in his preface, that it has not been his "purpose to write a complete history of modern philosophy," and that he has aimed at being something more than a commentator, holding it to be "a duty frankly to avow and earnestly to defend the whole doctrine which appeared to him to be just and true". How far his work is from being a complete history of modern philosophy may be indicated in his own words:—

"I have said little about Hobbes or Locke, Hume, Reid, or Hamilton whose writings are accessible to all, and who ought not to be studied by thoughtful and earnest inquirers at second hand. But the great names of Descartes, Spinoza, and Malebranche, of Leibnitz and Kant, of Fichte, Schelling, and Hegel, are little more than names with most English students," &c. (*Preface.*)

Our author cannot mean that the works of Descartes and Kant are inaccessible to the thoughtful and earnest inquirer, nor that such a personage may rest content with second hand knowledge of them; so that it is difficult to find in the above passage a reason why, in a volume which discusses Descartes and Kant pretty fully, Locke and Hume are almost unnoticed. Whatever be the case in America, the English public in these islands is calmly indifferent to the accessibility of Hume, and I believe the British student gives as much or more attention to Kant. The omission is the more noticeable because a whole chapter is devoted to Berkeley, whose works may also be called accessible, and deserving the personal application of an anxious inquirer; especially noticeable because Berkeley's historical importance must, in spite of his great discoveries, be considered less than Locke's or Hume's, since the influence which he might otherwise have directly exercised upon philosophy was presently, for the most part, absorbed into

Hume's. And Hume's influence was so great that how a student unacquainted with his doctrines can be made to understand Kant, is itself a matter not easy to understand.

As to the other side of the book, on which the author appears as something more than a commentator, its characteristics, too, may be indicated by a quotation from the preface:—

"Earnestly desiring to avoid prejudice on either side, and to welcome evidence and argument from whatever source they might come, without professional bias, and free from any external inducement to teach one set of opinions rather than another, I have faithfully studied most of what the philosophy of these modern times and the science of our own day assume to teach."

Thus disclaiming prejudice, he continues, not without a trace of emotion:—

"And the result is, that I am now more firmly convinced than ever that what has been justly called "the dirt-philosophy" of materialism and fatalism is baseless and false."

He then declares himself a Christian; and accordingly the work is to a great extent apologetic from that point of view.

It occurs to me to ask what that "professional bias" can be which is mentioned in the above quotation. Is it possible that, as American students sometimes assert, a "*Universitäts-Philosophie*," such as stirs the indignation and darkens the prospects of Radicals on the European Continent and is not without example amongst ourselves, exists even in the land of the free? This question was suggested by the first sentence of our author's account of Schopenhauer (chap. xxi.), where he says that he had hesitated long before introducing any account of Schopenhauer's writings into this work. "To analyse them, even for purposes of censure and refutation, seemed too much like promoting the dissemination of evil." For this is just the attitude of mind which the great pessimist ascribed in an exaggerated form to the German professors of his day. And then one could not help wondering whether a dread of disseminating evil had suppressed a chapter on Hume; though, of course, on remembering that other reasons, however unsound, had been given in the preface, the wonder subsided.

Since now this work has avowedly two aspects, it will be well to consider it in both—first as a history of philosophy, and then as a contribution to philosophy. And since as a history it contains no ambitious theory of how philosophy must necessarily have grown and developed, our task under this head will be to examine, as well as space permits, how far the exposition is impartial and trustworthy. But before entering upon a course which may perhaps lead to fault-finding, it may be said at once that the book is always readable. Very few books of the sort are as little likely to make a beginner think philosophy harsh and crabbed; and so, if it is not altogether satisfactory itself, it may do good service by inducing its readers to pursue the subject elsewhere.

In an interesting chapter on Descartes, the author finds that—

"The great defect of the Cartesian philosophy is, that it takes little notice of the idea of cause, and does not disentangle or present to distinct consciousness the great law of causality, though the whole system unconsciously pre-supposes the validity of this principle, not only as a law of thought, but also as a law of things" (p. 30).

And he charges Descartes with confusing "the relation between substance and attribute with that between cause and effect". By the law of causality, Prof. Bowen, I believe, does not mean the law of phenomenal antecedent and consequent, but a law expressing the necessity of an efficient noumenal cause. But in any sense it can hardly be maintained that Descartes' system only unconsciously pre-supposes such a principle. For although in the *Discourse on Method* it is not so explicitly stated as could be wished, it elsewhere has due prominence given to it. In the *Principles of Philosophy*, I. § 49, the axiom *ex nihilo nihil fit* is stated first in a list of eternal truths; and in II. § 36, Descartes says that it is intuitively evident to himself that God was the first cause of motion, having created matter with a certain quantity of motion and rest, which He has since preserved unchanged, thus manifesting His own unchangeableness; and he then goes on, in §§ 37-8, to state the first law of secondary causes, and to illustrate its quantitative aspect in the case of projectiles. The point appears important to Prof. Bowen, because he says that Descartes' expressions on this subject led to Spinoza's Pantheism, of which he has the deepest horror. But Descartes, when using the strongest expressions, as when he says that God upholds the world by the same action by which he originally created it, is careful to add that this view has the general sanction of theologians (*Discourse*, Pt. 5). It cannot be denied, of course, that the relations of the attributes to substance in Spinozism is derived from the relations of the three substances—the dependence of mind and matter on God—in Cartesianism; but that Descartes adopted this conception immediately from the current theology is equally indisputable. And the difference between Spinoza's and Descartes' views is not less obvious than the derivation. For Descartes conceives of God in relation to mind and matter far less frequently as the substance of substances, than as the cause of effects; in so far, of course, as cause and substance are transcendently distinguishable.

The tone of the chapter on Spinoza, elsewhere called "the remorseless Jew," and "the infidel Jew," seems to me unfairly disparaging; too much is made of his indebtedness to Descartes as a thinker; and his "irreproachable character" is accounted for by his having wanted the physique of a healthy sinner; "leading the life of an anchorite, not from principle or by any effort of self-denial, but simply for want of liking for the ordinary enjoyments of mankind". That ill health and virtue naturally go together is, however, contrary alike to reason and experience; it is not every invalid of whom it can be said that "he conciliated not only the goodwill, but even the strong affection of the few ordinary persons with whom the seclusion of his life allowed him to come in contact" (p. 60). Prof. Bowen's account of

Spinoza fails, like many others, by regarding him chiefly as a metaphysician, and almost forgetting that he was a moralist. Has any one explained why the *Ethics* of Spinoza has nearly always been treated as a volume of metaphysics? Is it that critics have not had patience to read far enough, or that dislike of the heretical metaphysician has made them willingly forgetful of the saintly moralist, or that the nature of substance and attribute is so supremely interesting to mankind that the conduct of life is comparatively unimportant? There are several mistakes in Prof. Bowen's chapter. Speaking of Spinoza's system as dependent on definitions, he says:—

"Spinoza has no right subsequently, at the conclusion of his philosophy, to pass from his ideal distinctions to the world of real things, and take for granted that he has proved human beings and other finite existences not to be substances *in any sense*—i.e., not to be realities—because he has shown that they are not substance in his sense" (p. 63).

But, in the first place, reality and substance are not synonymous, and Spinoza does not deny the reality of finite existences "in any sense": they are real to him as Modes of the Attributes of God. And, secondly, Spinoza does not take for granted the passage from his ideal distinctions to the world of real things at the conclusion of his philosophy; but, quite early in the *Ethics* (Pt. II., Prop. 7), supposes himself to prove that the order and connection of ideas and of things is the same. Again, describing the necessity of natural law according to Spinoza, our author writes:—

"Every volition even, every act of a conscious agent, is preceded by certain states of mind, all involuntary, on which it is necessarily consequent; and these mental states are the inevitable results of physical changes in the world without," &c. (p. 70).

But Spinoza says (*Ethics*, Pt. III., Prop. 2), the Body cannot determine the Mind to thought, nor the Mind the Body to motion. I must admit that in the last paragraph of the chapter (p. 72) Prof. Bowen shows himself aware of the truth on both points. But an historian cannot atone for having stated something wrongly on one page by stating it aright without any reference on another.

After a chapter on Malebranche we find one on Pascal: and our author's reason for giving so much space to one who is not usually regarded as marking an epoch in philosophy, is that he was the true originator of the "Philosophy of the Conditioned," which became a favourite doctrine with Hamilton. This is especially important, he thinks, because Mill attributed Hamilton's difficulties in dealing with the conception of Infinity to his ignorance of mathematics, whereas here we have them in Pascal, one of the greatest mathematicians. It is a little surprising that although Hamilton, when trying to show that his doctrine was as old as Philosophy (*Discussions*, Appendix I.), quotes from Pascal, he nowhere refers to one or two passages produced by Prof. Bowen (*Pensées*, Art. II.) which would have been much in point. It does not, however, surprise me that Mill did not notice them: for if I have the right passage (the almost total absence of re-



ferences is a grave defect in this book) the particular difficulty which he attributes to Hamilton's ignorance of mathematics lay in conceiving how one infinite could be less than another (*Examination*, p. 536, 3rd ed.); and these difficulties are not those which Hamilton may have taken hint of from Pascal. I regret to add that Prof. Bowen ascribes to Hamilton a mistake in the statement of his doctrine which was not one of those that he fell into: he represents him as supposing the infinitely great to be the contradictory of the infinitely small (p. 94). When Prof. Bowen has dissipated this illusion by re-perusing Hamilton's sixth Lecture on Logic, he may consider whether he has not himself fallen into a very similar error in attempting to state the doctrine at p. 93. It is a doctrine dear to him; for, "of course," he says, it "is destructive of Empiricism. All the space of which we have had experience, either through the senses or by the imagination, is finite or limited." Astounding! No tidings that ever reached us from the New World have so stimulated our curiosity to visit it. The boundaries of space are there the most familiar objects of contemplation. This must give the inhabitants an unfair advantage over Europeans in philosophising on the subject.

In the chapter on Leibnitz we read that the Monadology was "in the main a deduction from the doctrine of Innate Ideas, and from the Principles of Sufficient Reason, &c.," but whoever turns to *La Monadologie*, § 7, must perceive that the doctrine of Innate Ideas is an immediate deduction from the nature of Monads.

In the chapter on Berkeleyanism, Professor Bowen takes occasion to denounce the "monstrous Egoistic Idealism, or Solipsism, of Fichte, J. S. Mill, and the Positivists, who by denying both substance and cause, thereby deny the existence of any Non-Ego," &c. (p. 150). Dismissing the Positivists as an indefinite group of persons who, if really guilty of such incredible inconsistency, are justly to blame, it may be observed with reference to Fichte that to deduce is to establish, not to deny; and that the Non-Ego, cause and substance were, as he supposed, deduced in his system. Fichte did not, indeed, attribute original reality to the Non-Ego; but he was not singular in that; no one who believes in an Absolute Being, under whatever name, can attribute original reality to another. Surely it was enough that the Non-Ego was, for Fichte, necessary to the Ego's self-consciousness, and thereby necessarily partook of its absolute reality. Does any orthodox theologian venture to ascribe more reality than that to all creation? Similarly of Mill: he did not deny the existence of either substance, or cause, or Non-Ego; but only endeavoured to analyse them into their simplest elements, and to find expressions for them in accordance with the principles of a particular school of philosophy. Such a sentence as the above suggests that the writer has not mastered either the expressions or the ideas of any school but his own.

He might at least have been careful in little matters; but he cannot be trusted to state correctly the smallest detail. The form of Kant's *Prolegomena*, he says, is synthetical (p. 158): that it is analytical Kant himself takes the trouble to tell us in his preface. The whole of

Vol. III. of K. Fischer's *History of Modern Philosophy* is, he says, devoted to the *Critique of Pure Reason* (p. 160): only half of it is so devoted. Professor Bowen himself has five chapters on Kant, of which it can only be said that they are well worth correcting. Perhaps the best chapters in the book are the three on Schopenhauer: the worst is certainly that on Positivism.

After a ludicrous introduction, in which we read that a reaction "has brought back in all its essential features the philosophy of the eighteenth century;" that Mr. Darwin "repeats Helvetius and Lord Monboddo"; that Mr. Spencer "develops at great length the noted hypothesis of Condillac;" that Prof. Huxley's sensible wish to be wound up every morning "to think what is true and do what is right," was such as "a Danton or a Desmoulins might have uttered while projecting the September massacres" (p. 261):—after this, we find Positivists distinguished into the disciples of Comte, and a group of thinkers who, our author says, are really disciples of Hume. From the account of Comtism proper take this choice sentence: its theology "inculcates the systematic worship of that gigantic idol representing humanity at large, or the whole human race, which Hobbes of Malmesbury called 'the Leviathan,'" &c. Perhaps that is enough. For the outer Positivists, really disciples of Hume, Professor Bowen takes J. S. Mill as their type, and associating with him Mr. Spencer, Mr. Lewes, Mr. Darwin, Profs. Helmholtz, Huxley, and Tyndall, empties his quiver at them indiscriminately. It would be well to re-write this chapter, or omit it altogether, from another edition.

We must now try to summarise Prof. Bowen's own views. He holds that our ideas of substance and cause are given in the self-consciousness of the Ego. In volition we are immediately conscious of originating force; and since matter and motion are reducible to forces, and these forces to one, we must infer that this also is the manifestation of a Will. Our author is a staunch upholder of Free Will; and the idea of invariable natural law determines him to strong language: "If one could believe it—thank God that I do not!—it would drive him to suicide" (p. 71). It may be inferred from many indications that these chapters were originally lectures.

Innate ideas (which, with the testimony of consciousness, play a prominent part in our author's reasoning) are to be known by the mark of universality and necessity: but whether he holds that what is inconceivable is non-existent or absurd, cannot be clearly ascertained. For at p. 59 we read:

"I accept, therefore, the doctrine of Pascal, Hamilton, and Mansel. There is an absolute necessity, under any system of Philosophy whatever, of acknowledging the existence of a sphere of belief beyond the limits of the sphere of thought."

But when at p. 67 it becomes desirable to overwhelm Spinoza, we read:

"(It (Spinoza's system) annihilates both God and the universe, by resolving both into the inconceivable abstraction of a universal Substance, which is to us, because inconceivable, a nonentity.)"

Prof. Bowen, in all his encounters with Empiricists and Positivists, never explicitly refers to the Association of Ideas until p. 448, in the last chapter but one (on Hartmann); and there he seems to think that Memory is better explained by the agency of "The Unconscious"—seems, I say; for indeed, whilst reading such a book, one begins at last to doubt the testimony of consciousness. Of inherited experience he can never have heard: for, at p. 270, he quotes from Mr. Spencer: "The gradual accumulation of experiences, however, and still more the organisation of experiences"—and adds—"that is, we suppose, the progress of Science". He might have learnt better from *Cosmic Philosophy*, the meritorious work of his countryman, Mr. Fiske. Illustrating the view that we know universals before particulars, by the growth of language, he says:

"Every object that the young child sees is *thing—something*; next, it knows *hard things* and *soft things*; next, *wood, iron, and stone*; next, *tables, chairs, clocks*; and last of all, *papa's own arm-chair*."

If this were true, we might surmise that that Stoic who, dissatisfied with  $\tau\omicron\ \delta\upsilon$  as the Summum Genus, superseded it with  $\tau\omicron\ \tau\acute{\epsilon}$ , adopted the idea from his baby. But it is not true of British babies, nor perhaps of any, unless their minds have been precociously and perversely developed by being confronted on every hand with the limits of space.

On the whole it must be said that Prof. Bowen's erudition is deficient in accuracy and perception, and probably a little one-sided. The errors noticed above are not a tithe of what could be produced from his book; and some of the sins of commission imply that the sins of omission are not without their own sufficient reason. Occasionally, too, in his pages we meet with words of aspect strange. If Prof. Bowen would rather be called a "speculatist" than a thinker or philosopher, perhaps he is right; but he ought not thus to nickname others unless he is sure they would like it.

CARVETH READ.

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*Thoughts on Logic*; or, *The S,N,I,X, Propositional Theory*.  
London: Trübner, 1877.

In this anonymous little essay an attempt is made to work out a new and comprehensive theory of the logical proposition. The principles from which the author starts are the following: (1) That the proposition expresses affirmatively some relation between two objects regarded as totalities; (2) that the objects as totalities are the subject of the proposition, while the predicate is the special relation affirmed to exist between them; (3) that all relationships are reducible to the four of Substitution, Exclusion, Inclusion, and Intersection, symbolised by the letters S,X,N,I. He endeavours to show that these relationships contain all that can be expressed in judgments, that they simplify the doctrine of inference, and that they obviate many of the difficulties inherent in the ordinary doctrine of the proposition. It must be specially noticed that in order to make his theory workable, the author is compelled to put a quite peculiar meaning upon the

logical symbol *some*. He thinks *some* is used in two senses, as a specific or particular *some*, and as the sign of partition, in which case it is equivalent to *some only*. It is difficult to understand what is meant by *some* as a specific quantity, especially as the author seems to think that when so employed it is equivalent to a universal. In no sense whatever is this the ordinary logical doctrine. According to it, *some* is always indefinite and equivalent to *some at least, it may be all*.

Substitution, Exclusion, Inclusion, and Intersection are the well-known relations between notions or concepts in Extension. When applied to judgments, even if the view be admitted that the judgment does express relations of classes, it is easily seen that they are far from being simple. In point of fact they are highly complex, and to be of service at all in the process of inference require to be expressed in the propositional forms of the old and new Analytic. Take for example Inclusion,  $\rho$  includes  $\delta$ . The full meaning of this thought, as the author himself admits, is—All  $\delta$  is only some  $\rho$ , Some  $\rho$  is not  $\delta$ , and when we infer we are invariably employing one or other of them. So too the Intersective relation,  $\delta$  intersects  $\rho$ , is not a simple thought but highly complex. Strictly analysed it yields Some  $\delta$  is some  $\rho$ , Some  $\delta$  is not all  $\rho$ , Some  $\delta$  is not some  $\rho$ , Some  $\rho$  is some  $\delta$ , Some  $\rho$  is not all  $\delta$ , Some  $\rho$  is not some  $\delta$ . A further judgment which, according to the author, is given in Intersection, *viz.*, that of inclusion between each total class and a part of the other, is merely an illustration of the ambiguity attaching to the word *all*. In true logical judgments *all* is distributive; in the supposed judgment of Inclusion it is collective.

We object then to the proposed classification of judgments on the ground that the relations affirmed are complex and must be expressed in the ordinary propositional forms before they can be applied. This objection would hold good, even if it were admitted that the logical judgment does express relations between objects thought as wholes. But such a definition of judgment, practically identical with Hamilton's view, seems far from satisfactory. Does it throw any light on the nature of the relation between subject and predicate in the judgment *some flowers are white*, to say that this is equivalent to *flowers and white objects intersect*?

Apart from the main idea of the book there are certain minor points open to discussion. The particular meaning put upon *some* and the use of *some only* as a simple symbol seem to us erroneous. *Some only* really yields a double judgment, the I and O of the Aristotelian logic. The relation of Substitution is a most perplexing one. It is, according to the author, both extensive and intensive. Now in a judgment of extensive substitution, can it be said that we affirm a relation between *two* objects? There is only one object. Substitution, as the writer seems to grant, is only denominational. But he also advances a peculiar doctrine as to particular intensive substitution, which we have the greatest difficulty in comprehending. The example given (p. 63): "Non-lovers of Turkish rule include Gladstone; non-lovers of Turkish

rule include Carlyle;  $\therefore$  certain Gladstone and Carlyle substitute"—throws no light on the matter. Indeed the writer is throughout far from clear with regard to intension. Holding that all relationships are reciprocal (e.g., if A substitutes B, then B substitutes A), he maintains that in Inclusion the reciprocal relation is that between intensions. Now, either he has a doctrine of intension entirely at variance with ordinary logic, or he must solve the question whether an intensive judgment can be quantified. If one reflects on the meaning of intension, one readily sees that it cannot possibly be quantified. *Some humanity, e.g.,* is quantified only in words: a few of the attributes making up humanity is not logically equivalent to *some humanity*. Hamilton himself never attempted to apply his doctrine of quantification to the so-called comprehensive judgment. When we attempt to throw a particular judgment into intensive form, the perplexity becomes greater. How shall we express *some flowers are white* intensively? It cannot be, as the author seems to say (p. 34), *some white things have the attribute florality*, for here the subject is in extension. Shall we say *some whiteness is florality*? This is doubly absurd. In short the intension of some A is precisely the intension of all A; and the particular extensive judgment has no exact counterpart in comprehension. It may be pointed out in addition that if judgments of the forms All  $\delta$  is  $\rho$ , Some  $\delta$  is  $\rho$ , could be expressed in comprehension, they must be analytic. In no synthetic judgment can it be said that the intension of the subject *includes* that of the predicate.

While giving the author all credit for ingenuity we cannot avoid the thought that his labour has been to a large extent wasted. The relationships insisted on are not simple but complex; when analysed or expressed they yield no results beyond the eight forms of Hamilton's Analytic; and so far as we have tested the forms of syllogism proposed by him, we have only found reason to dissent from those which are distinctively new. The idea of carrying the relations between concepts into the theory of judgment is hardly a novelty: Twisten, for instance, discusses the question and rejects the very four relations here given; and the view of intensive inclusion as the *converse* of extensive inclusion, though not in so many words stated by Hamilton, is found clearly expressed in Spalding (*Logic* § 49).

R. ADAMSON.

## VIII.—NOTES AND DISCUSSIONS.

*The Genesis of Primitive Thought.*—It is somewhat to be regretted that Mr. Tylor, in his interesting notice of Mr. Spencer's *Principles of Sociology* (MIND, No. VI.), has not dwelt more fully on the main points in dispute as to the genesis of primitive thought. While justly claiming that Mr. Spencer's teaching agrees with his own as regards the origin of Animism—certainly a point of great importance,

he has scarcely given due prominence, or at least due discussion, to what is most original in Mr. Spencer's account of the growth of the primitive man's conception of nature. In two ways Mr. Spencer is strikingly original: first, in repudiating the ordinary doctrine of a primæval Fetishism—the doctrine that man in his earliest state necessarily ascribed life to lifeless things, and imagined living wills in all objects; secondly, in attempting to explain this habit of vitalising lifeless objects, and all that is commonly named primitive Anthropomorphism, as solely the result of the belief in ancestral ghosts. The deep and increasing interest of the subject prompts me to offer a few remarks on the genesis of primitive modes of thought as viewed under these new lights.

By discarding primæval Fetishism, Mr. Spencer, it seems to me, has made a great advance towards a truer conception of primitive culture than has hitherto been attainable. The doctrine has long been assumed or asserted by anthropologists, but has never been supported by good evidence. For, though the habit of attributing life and feeling to lifeless things is indeed universal among savage and barbaric races at the present day, and prevailed, we may infer, among the early ancestors of all existing races, in all its manifestations it presents the characters less of a primary than of a secondary habit of mind—the source of a system of extra-beliefs superimposed on deeper beliefs, and inconsistent with these though existing along with them. As Mr. Spencer has pointed out, it is incredible that man at any stage should have been ignorant of the distinction between things living and lifeless—a distinction necessary for his self-preservation, and one which almost all the lower animals more or less clearly recognise. Nay, it might perhaps be more reasonable to maintain that the habit of vitalising lifeless agents really depends on a too absolute contrast of lifeless and living things as respectively characterised by inertness and spontaneous motion. Conceiving lifeless things as wholly incapable of self-originated motion, the primitive man could only explain their sudden and life-like actions, when such occur, by attributing to them life and will, or imagining some living entity as acting upon them. If this were so, it is easy to see that the doctrine of souls, by affording a simple and universally applicable means of artificially vitalising lifeless phenomena, would foster the habit to any extent. Some evidence in favour of this view may be found by examining the later developments of primitive philosophy,—such as the doctrines of a Vital Principle and the Lawlessness of Volition—which part the living from the dead or inert by an absolute line. It was left for modern science to remove the hard-and-fast dualism of primitive thought, and demonstrate the identity of vital and physical forces.

Mr. Spencer seems less successful in working out his conception of Animism as sufficient to account for all primitive Anthropomorphism. Most readers will agree with Mr. Tylor that the processes of verbal confusion by means of which he conceives the transformation of ancestor-worship into Anthropomorphism to be effected, afford a very

inadequate explanation of the facts. No one can doubt that the belief in souls, though it has not created, has yet greatly fostered the habit of ascribing life to lifeless things; but the chief difficulty now encountered by the students of primitive culture, is to determine what other elements have combined with Animism to produce a mental habit at once so persistent and so unreasonable. Mr. Tylor, who would hesitate to express an opinion that had not been well considered, still, in spite of Mr. Spencer's reasoning, holds by the notion of a direct personifying and myth-making tendency, on the ground that "to both the child and the savage, human will is the first-conceived source and reason of action". To conceive the Sun or the Sky, the Woods or the Rivers, "as great beings acting by will, and able to do good or harm to men," "is the easiest way in which rude minds can contemplate them". It may be objected to this doctrine, that if, as we above supposed, lifeless things are clearly distinguished from living things by the primitive mind, such a fanciful way of conceiving them could not be the easiest way. Even in the rudest mind it would demand an "effort of imagination". Possibly, however, the doctrine of a direct personifying tendency may be reconciled with the denial of a primeval Fetishism, if we suppose that, though the primitive man has no tendency to regard inert bodies as alive, the sudden and seemingly spontaneous motions of many lifeless things will naturally suggest to him the presence of life. Mr. Fiske says primitive Anthropomorphism is simply a corollary from the Relativity of Knowledge: all things known to man are known in terms of human feeling and perception, and, while civilised minds have come to conceive physical forces as mere impersonal pressures and resistances, the natural tendency of primitive minds is to regard lifeless bodies as impelling or resisting one another by conscious effort. This is an explanation having a certain plausibility; but we have already seen cause to discredit any account of Anthropomorphism which represents it to be a necessary and primary mode of thought. Professor Max Müller and others have proved with abundant illustration that Language has had an immense influence in developing Anthropomorphism. Metaphors drawn from the actions of men and animals must, it is obvious, have aided the habit of vitalising lifeless things, if they did not actually give rise to it. So must verbal misunderstandings. On the other hand, there appears no ground for believing with some writers that gender-terminations in names have given rise to Vitalism; much less, that they have descended from a time when all lifeless things were distinguished according to sex. Philologists have shown that genders vary in number in different languages; that their existence is due to mere linguistic accident, and not to any primeval personalising of nature. Some of the Emotions favour the vitalising habit. Affection, dislike, and anger are often called forth by lifeless objects, and may readily suggest a possibility of their being returned. The social instincts in general, and each man's absorbing interest in the doings of his fellow-men, tend to the same result. Indeed, of all possible factors of the



personalising habit, probably one of the most powerful is the instinct of *expression-reading*—the well-organised power which all men seem to possess of interpreting human looks and gestures. To this faculty Anthropomorphism gives unconscious exercise. We may perceive how automatically it comes into play, on reflecting how apt we are to discover in lifeless things the semblance of human features.

Whether these suggestions give ground sufficient for a theory of the genesis of all Anthropomorphism and Vitalism can only be determined by further investigation. We may hope in time to understand primitive thought much better than we do at present, for it has a logic of its own, and though very unreasonable is not irrational.\*

A. C. OUGHTER LONIE.

\* This Note was in type some months ago, but at the last had to be left over from No. VIII. Even if it had appeared in October, its author (as I afterwards learned) would not have seen it, for he had died some weeks before. Mr. Oughter Lonie, whose life was thus cut short, after a lingering illness, at the age of 26, had been a very distinguished student of philosophy at the University of St. Andrews, whence he passed to Edinburgh to make a special study of geology. A career as a practical geologist was opened for him, but he preferred to return to the field of philosophical work. In the new edition of the *Encyclopædia Britannica* he wrote the article on 'Animism,' and the remarks appended to its expository part give evidence of a power of thinking that might have come to much. All those who knew him speak with admiration of his intellect and character, and his untimely fate has blasted many hopes.

EDITOR.

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*Development of the Sense of Colour.*—In the October number of the *XLIXth Century* Mr. Gladstone has an interesting and very learned paper on the Colour-Sense, in which he endeavours to prove that the Homeric Akhaians had little or no perception of colours as such, but merely a power of distinguishing light and shade. This view appears to me extremely untenable, and I hope at some future time to give reasons on the other side at greater length. Meanwhile, I seize the opportunity kindly accorded me by the Editor of *MIND* to summarise with necessary brevity the arguments which may be offered against it.

There is every reason to think that the perception of colours is a faculty which man shares with all the higher members of the animal world. In no other way can we account for the varied hues of flowers, fruits, insects, birds, and mammals, all of which seem to have been developed as allurements for the eye, guiding it towards food or the opposite sex. The facts of mimicry, often minutely faithful in every line, spot, hue, and shade—as abundantly illustrated by Messrs. Darwin and Wallace—point in the same direction: for such careful imitation would have been useless unless it aided the mimicking organism in eluding the vigilance of enemies. To come to specific cases, Sir John Lubbock's experiments show clearly that the social insects have a colour-sense essentially identical with our

own: while some special instances of their discriminativeness in flowers go far to prove an intensely accurate power of perception. Amongst vertebrates, birds and mammals give many signs of considerable colour-sense, as witness the antipathy of male ruminants to the sight of scarlet, and the readiness with which birds distinguish fruits, &c. How otherwise could we explain the very definite and gorgeously-arranged colours of the peacock, the argus-pheasant, and the mandril? Even among reptiles, Kühne has recently shown\* that frogs (unless blinded) exhibit a preference for blue over green glass, special care being taken to exclude all possibility of error through differences of diathermancy, &c.; and it is noticeable that these two colours are the very ones which Mr. Gladstone looks upon as the last to be discriminated. Finally, in the eyes of nocturnal vertebrates, such as owls and bats, we find an absence of certain structures (the cones) which are held to be the organs for the perception of colour, and a presence of certain others only (the rods), which are held to be those for the perception of light and shade alone. But in man and most other mammals, both sets of organs are found, and I believe the nature of their separate functions has seldom been doubted. From these various cases (only briefly selected out of hundreds that might be alleged) we are justified in concluding that the colour-sense is a faculty far more ancient than the development of man, and not (as Mr. Gladstone argues) one but lately evolved.

Again, if we look at the various races of men—since Mr. Gladstone would probably refuse to accept an argument drawn from Darwinism—we shall find very low types of humanity possessing a colour-sense far more acute than that which Mr. Gladstone assigns to the semi-civilised Homeric Akhaians. My own observations on negroes (made in order to test Mr. Gladstone's earlier utterances on the same subject) convinced me that they possess exactly the same sensations in this matter as the ordinary European. They can distinguish in just the same way between primaries, secondaries, and even more delicate hues. A visit to the Ethnological Room at the British Museum will show that the Polynesians, North American Indians, Mexicans, and Peruvians, have or had the power to distinguish red, yellow, green, and blue. Furthermore, to go back in time, the Egyptian wall-paintings, papyri, mummy-cases, &c., are decorated with an infinite number of shades and mixed colours, which reach their highest development under the XVIIIth and XIXth Dynasties (surely quite early enough for Mr. Gladstone), and become less intense and varied at a later date. Among them, the greens, blues, yellows, and their compounds, are especially noticeable for their delicacy and variety. As to the beads, they are almost as beautiful and diversified as those now manufactured for the Central African trade. I think nobody can look at the Egyptian remains in the British Museum—still less at the great collections of fac-similes—without recognising not only colour-perception in a high degree, but also remarkable taste in blend-

\* *Untersuch. aus dem Physiolog. Inst. in Heidelberg*, Band i., Heft 2.

ing and delicacy of hue. On the other hand, *chiaroscuro* is totally wanting; so that, if we were to argue from the single case of Egyptian painting, as Mr. Gladstone has argued from the single case of Homeric poetry, we might arrive at the diametrically opposite conclusion, that early man possessed a developed colour-sense, but no perception of light and shade.

How then are we to explain the singular fact, which Mr. Gladstone undoubtedly succeeds in proving, that the Homeric ballads contain few actual colour-epithets? In the following manner, it seems to me. Language is at any time an index of the needs of intercommunication, not of the abstract perceptions, of those who use it. Now, in nature, the bright-coloured objects are chiefly flowers, fruits, birds, butterflies, autumn leaves, and other organic products, of little practical importance to the Akhaian warrior. The objects which he needs to describe are earth, sky, clouds, sea, men, arms, cattle; all of them indefinitely coloured, and many of them liable to great changes in light and shade, or great variations between individuals. Hence the need for colour-terms does not practically arise. Again, the growth of colour-terminology seems to me to be greatly dependent upon the art of dyeing, and the consequent use of pigments for human decoration. In our own time, such colours as mauve, magenta, *solferino*, *écru*, &c., only come to have names as fashion introduces them into dress: and the vocabulary of artists, house-painters, milliners, and drapers, is much richer in colour-terms than that of ordinary Europeans. So the two words which most express colour in the Homeric ballads are those which refer to the dye of the Tyrian murex and the so-called vermillion. Both of these were probably more or less reddish; and we know from modern experience that reds and purples are the colours which children and savages most admire. I have tried elsewhere to account for this preference: it is sufficient here to note that red seems everywhere the earliest colour used for decorative purposes. On the whole, I think we may conclude that while a loose chromatic sense is to be attached to two or three Homeric words, the majority of visual epithets occurring in the ballads are to be accepted as referring to light and shade alone; because the need for colour-terms was not yet felt among a race of non-manufacturing warriors, and because the gleam of bronze, the light of day, the bright or lowering sky, the indefinite hues of man and horse and cattle, were far more relatively important than the pure tints of flowers and insects, or the almost unknown art-products of Egypt, Phœnicia, and Assyria. As for the range of Homeric colour-epithets, I think it sufficient to note that we ourselves talk of a red sky, red wine, red bricks, a red cow, red lips and red Indians; or of blue heavens, blue sea, blue eyes, blue frock-coats and blue slate.

It will be obvious that I have only given such principal headings as seem indispensable, and have been precluded from further illustration by want of space. But the three points I have tried to make out are briefly these; (1) That colour-perception is a common possession of men and animals; (2) That it is therefore, *a fortiori*, a

common possession of all normally-developed men; (3) That the want of colour-epithets in the Homeric poems is due to a defect of language rather than of perception, such as might naturally be expected from the circumstances of their authors. As to the existence and personality of a Homer, that is quite outside the present question.\*

GRANT ALLEN.

\* A short notice of the two tracts, by Dr. H. Magnus of Breslau, which called forth Mr. Gladstone's recent utterance on the subject, will be found below under the head of New Books. Prof. Robertson Smith, in a letter that appeared in *Nature* of Dec. 6th, gives brief expression to a view of the question essentially the same as Mr. Allen's (whose Note was independently written some weeks before), and cites a most interesting passage from Athenaeus, *Deipnos.* xiii., 81, which proves that the Greeks themselves were perfectly well aware of the looseness of their poetic vocabulary of colour.

EDITOR.

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"*Transposition of Traces of Experience.*"—To the process thus aptly designated Mr. Verdon devotes a short paragraph in his valuable article on "Forgetfulness" in the last number of *MIND*. In each instance of its occurrence, as there represented, we find involved two objects of memory,—(1) a pair of words, syllables, or sounds, and (2) their order in a sentence. The former of these, viewed independently, are supposed to be perfectly well remembered: failure of memory exhibits itself only in respect of the latter. The writer adds that "the whole family of Malapropisms is nurtured upon this peculiarity". Now this general statement may or may not be true in its fullest extent; but before we admit its truth, we must at any rate examine many other typical examples of transposition than those of the exact kind indicated by Mr. Verdon.

At the outset, 'Malapropism' may be referred to a more general 'Maladroitness,' which brings dumb actions within our purview. In fact, the transposition of these is often more striking, and sometimes more amusing, than that of words. Thus a man shall, like Will Honeycomb, be standing by a river-side with his watch in one hand and a pebble in the other: he shall "squirr away his watch" into the water, and shall ("with great sedateness") pocket the pebble. Here the two familiar actions transposed correspond to the two remembered words above referred to, and just as these may be accurately spoken, so may those be accurately performed. But here, and generally, the order of combination is totally *new*,—an arrangement *proposed*, and not formerly learnt. How far, then, and in what sense, is a perturbation of that order chargeable upon failure of memory? Shall we say that an order of procedure is directed by the mind and instantaneously forgotten? or is, perchance, the apparently perturbed order of procedure the one actually directed, while forgetfulness relates to the positions of the objects,—it being momentarily forgotten that the watch lies (say) in the right hand, and the pebble in the left? And

what, if those positions have not been accurately perceived? Can that be, strictly speaking, forgotten which has never really been apprehended?

In a certain sense, indeed, we may be said to forget everything but the object on which the mind is, at each successive instant, actually fixed; nevertheless mistakes that fall within the present moment (this being understood to correspond with a material rather than a mathematical point) are generally charged upon want of *attention*. It would seem sometimes, as if the mind, after directing the performance of two actions, instead of superintending the performance, leaves the limbs to act, so to say, automatically; and these excite that action first which, from a nerve-and-muscle point of view, is the more important, or to which the more energetic impulse has been given. Or, again, the operations of the mind being much more rapid than the movements of its material agents, these—the limb, the tongue, the pen—necessarily lag behind, and are continually trying, as it were, to catch it up by leaping to that point in the line of thought to which the mind has preceded them; while the mind is as continually running back to bring them up abreast of itself. When these two movements occur simultaneously the result is some more or less grotesque transposition.

Hence, a general condition of *complete* interchange of two such actions, words, or what not, is that they fall pretty close together,—close, *i.e.*, in time. If hand or tongue lags behind by any long interval, the mind, in reverting to its agent, usually discovers, and if possible rectifies, the first mistake, or at any rate prevents the perpetration of the counterbalancing one. This is nearly always the case in the comparatively slow process of writing. In a rapid succession of actions, moreover, the attention may be forcibly recalled by the oddity or physical effects of the first mistake. Thus, a friend of mine, dressing in great haste, and intending to use his shaving-brush and tooth-brush in succession, dashed the former vigorously into his mouth. Need it be added that he did *not* apply the other to his chin?

But this uncompleted interchange must, in the case of words, be discriminated from a species of Malapropism in which no interchange is either intended or possible; as *e.g.*, when Mrs. Malaprop herself talks of the burning *lather* running down Mount *Vociferous*. Here we step over our bounds into the region of what the Germans call *Volks-etymologie*, and find ourselves among linguistic phenomena of the "sparrow-grass" type. A foreign or strange word (never correctly apprehended) is assimilated to a native or familiar one; and then some absurd reason is invented for the special application of the latter.

But purely phonetic interchanges may certainly be embraced under the general process. These, although curtly dismissed by Mr. Verdon, are perhaps more interesting and linguistically important than any others. The accidental slips (for example, with their *h*'s), to which the best-educated people are liable, are indeed mere trifles, and are

explicable in the same way as the interchanges above referred to. But in other classes of society real or apparent varieties of such phonetic interchange, which I have elsewhere designated "Cross Compensation" (*Grimm's Law*, Trübner, 1876) have established themselves as dialectic characteristics. Thus the plant-seller that haunts our ways all the summer vociferates "Roots for your garning all agrowin and ablowin"; and the lavender girl that follows him sings "sweet-smellin lavin'yer," &c. This class of instances, therefore, offers for investigation not only an origin but a history.\*

The object of this note, however, is not (as is obvious enough) to investigate these curious phenomena, so much as to suggest that they deserve investigation. If Mr. Verdon, or some other professed psychologist, would subject them to a thorough discussion, he would, besides amusing himself, instruct inquirers in other lines of study (language, for example) which, without being purely psychological, necessitate a frequent reference to psychological principles.

T. LE M. DOUSE.

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*Prof. Jevons's criticism of Boole's Logical System.*—The appearance of a new edition of Prof. Jevons's *Principles of Science* shows that his partial adaptation of Boole's system has gained a wider circulation than its original, and renders not inopportune a few words on the two men.

In the preface to this second edition Prof. Jevons says: "As to my own views of Logic, they were originally moulded by a careful study of Boole's works, as fully stated in my first logical essay". So it has seemed best to me to go back to this *Pure Logic* of 1864, and taking his first and last works together, to discuss carefully his criticisms of Boole. In both books one is struck by the fact that Prof. Jevons has never risen from the conception of the old Algebra of Number to the idea of Algebras in general. For him "all the wondrous branches of mathematical calculus" are merely developed Arithmetic (*P. of S.*, p. 162). Yet he appreciates the importance of Descartes' mathematical discovery without noting that it was really making a new Algebra, the Algebra of Geometry, introducing the directed line, the variable, &c., and not being a mere outgrowth from the old Algebra of Number. He mentions also the new Algebra of Quaternions, which contains laws flatly contradicting those of number, yet he does not draw the obvious conclusion. Finally, though Boole's Algebra of Logic is founded on the condition  $x^2 = x$  or  $x(1 - x) = 0$ , which is not true of numbers in general, Prof. Jevons persists in considering it "a numerical system".

What would he say of Grassmann's system, of Mr. Spottiswoode's

\* Many examples may be collected by the student of English popular idioms. A collection from the German dialects has recently appeared in Herr J. F. Kräuter's treatise *Die Lautverschiebung*, pp. 60-62.

little paper on Recent Algebras, finally of the Linear Associative Algebras of Prof. Peirce? Are they all the same old original Algebra of Number? As Prof. Peirce says: "Qualitative relations can be considered by themselves without regard to quantity; the algebra of such inquiries may be called logical algebra, of which a fine example is given by Boole". Yes, in spite of Prof. Jevons's continued mistakes on this point, what Boole actually did was to create the first and greatest Algebra of Logic. And now we are able to rate at their proper worth all attempts to "divest his system of a mathematical dress".

From this foundation we are ready to take up in order the objections made by Prof. Jevons to his master's system, and I think we shall see that nearly all of them are mere corollaries of his First Objection, which itself is untenable. It has reference to the old question about the proper method of expressing alternatives. In popular usage, says Prof. Jevons (*Pure Logic*, p. 77), "the meanings of terms joined by 'and' or 'or' vary from absolute identity up to absolute contrariety". But, as Mr. Venn says (*MIND* IV., p. 489)—"The really important thing is to improve upon popular vagueness, by keeping prominently before the mind the fact that there is this ambiguity. This is just one of the things that symbolic language can and should do, and Boole's expressions have the merit of great clearness and precision here. Sometimes what we mean is 'A or B or, it may be, both'; sometimes 'A or B but not both'. These are surely such distinctive meanings that it is a real blemish in common language to merge them together, for we certainly ought to know, in any given case, which of the two we have in mind. This Boole indicates by always using  $a(1 - b) + b(1 - a)$  for the exclusive sense, and  $a + b(1 - a)$  for the non-exclusive." I perfectly agree with Mr. Venn that Boole is here quite unassailable, yet Prof. Jevons's Second and Third Objections depend directly upon this First, and vanish into thin air with the hook on which they hung.

He words the Second Objection thus: "There are no such operations as addition and subtraction in pure logic," for which statement his proof is that in *his* Logic, which leaves the alternatives indefinite, one cannot safely subtract. This looks like an argument against himself, and is certainly no argument against Boole. Again, acknowledging that "subtraction is valid under the logical restriction that the several alternatives of a term shall be mutually exclusive or contrary," he tries still to uphold the point by saying that the result of the subtraction can be obtained by combination. What of that? In arithmetic the result of multiplication may be obtained by addition. Does that prove that there is no such operation as multiplication in arithmetic?

The Third Objection hangs likewise on the untenable First. Boole found he could make a more perfect system by postulating that each two terms must be logically distinct, and so in his system there was no such thing as what Prof. Jevons has named the Law of Unity, ( $A + A = A$ ) Making what seems to me a puerile application of this law to a system which expressly excludes it, he says that  $x - x$



$+x$  must not in Boole's system reduce to  $+x$ , as it would if it ever could occur there, but by the application of this law (from another system) it must reduce to 0.

The Fourth and last Objection in his *Pure Logic* is also to a certain extent, I think, founded on a misconception. Logic is primarily no more an algebra than chemistry. It was simply a science capable of having an algebra made for it, and so in making the first Algebra of Logic, Boole was called upon to settle once and for all the meaning of the symbols he chose to employ in his system. Very wisely he settled most on the ground of *analogy* to the interpretations adopted in the oldest algebra, and thus  $\frac{0}{0}$  received the meaning of 'some,' an *indefinite class term*. But his critic understands this to mean that wherever  $\frac{0}{0}$  appears "we must have another distinct system by which to get that meaning". Two sections before the conclusion of his book he adds: "Supposing it prove true that Prof. Boole's Calculus of 1 and 0 has no real logical force and meaning, it cannot be denied that there is still something highly remarkable, something highly mysterious in the fact, that logical forms can be turned into numeral forms, and while treated as numbers, still possess formal logical truth". This would indeed be highly mysterious if Boole's algebra had no real logical meaning, but the mystery vanishes when we recognise that the algebra which Boole made for logic was subjected to such laws of operation that, had we desired to apply it to numbers, unity and zero would have satisfied all its requirements.

So much for Prof. Jevons's *Logic of Quality*. I will simply add that he transfers the same objections to his *Principles of Science*, 2nd Ed., pp. 68-71, &c., and that they gain no force in the transfer.

In his *Elementary Lessons in Logic* (1870), I will notice only this one sentence, p. 191:—"Dr. Boole regarded Logic as a branch of Mathematics and believed that he could arrive at every possible inference by the principles of Algebra". Here again, Mathematics and Algebra are taken for science of Number; but it entirely misrepresents Boole, to whom Mathematics had a meaning almost as broad as to Prof. Peirce, who scouts the idea that its range is limited to quantitative research. "Mathematics," according to Prof. Peirce, "belongs to every inquiry, moral as well as physical. Of some sciences, it is so large a portion that they have been quite abandoned to the mathematician. Such is the case with geometry and analytic mechanics. But in many other sciences, as in all those of mental philosophy and most of the branches of natural history, it is of no practical value [at present] to separate the mathematical portion and subject it to isolated discussion."

Prof. Jevons himself has had this fact at last forced to some degree upon his attention, for at p. 155 of his new edition of the *Principles of Science*, he quotes this sentence from Boole, which he should have noticed thirteen years ago:—"It is not of the essence of mathematics to be conversant with ideas of number and quantity".

Reading on from p. 155 to p. 162, we may notice that Prof. Jevons's whole doctrine of the nature of Number grows out of his study of the Algebra that Boole made for Logic. He even goes so far as to say,

p. 158: "I conceive that all numbers might be represented as arising out of the combinations of the Logical Alphabet, more or less of each series being struck out by various logical conditions". Does it not seem a little more rational to suppose that if we have a series of four terms, we already have the number 3, and do not, as he says, get it "from the condition that A must be either B or C, so that the combinations are ABC, ABc, AbC".

Boole discovered that an algebra, in order to be fitted for application to Logic, must recognise the law  $AA = A$ , or (as he better expressed it)  $x^2 = x$ , or  $x(1-x) = 0$ ; which combines two laws since it expresses what in Prof. Jevons's notation would be written  $Aa = 0$ , and it was called by Boole the Law of Duality as showing that we always naturally perform dichotomy, dividing the universe into  $x$  and *not*  $x$ , so that  $x(1-x) = 0$ ,—a thing cannot be both  $x$  and *not*  $x$ . Boole thought that only two numbers obeyed this formal operative law  $x^2 = x$ , namely 1 and 0. But Prof. Jevons discovers, p. 161, that, "In reality all numbers obey the law. . . . In short, *twice two is two*, unless we take care that the second two has a different meaning from the first." If every second 2 must have a different meaning from the first 2, how is it that the one can be substituted for the other wherever it occurs? Is this not rather a forced way of trying to prove the statement at p. 156: "Number is but logical discrimination, and algebra a highly developed logic". He goes on (p. 162): "Mathematical symbols then obey all the laws of logical symbols". If this is true, we must credit Boole with one more great discovery in Pure Mathematics, for he brought to light a fundamental law of number,  $x^2 = x$ , which no one before him had suspected, and which I cannot believe even on Prof. Jevons's assurance.

At p. 113, he says generally of Boole: "It is a wonderful evidence of his mental power that by methods fundamentally false he should have succeeded in reaching true conclusions and widening the sphere of reason". For my part, I did not know that any mental power would enable methods fundamentally false to produce invariably true results.

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*Mill's Theory of the Syllogism.*—In Mill's famous chapter on the Functions and Logical Value of the Syllogism, it seems to me that he has included under the Syllogism two things that ought to be kept separate and distributed under different heads in the logical system. Perhaps I may even go the length of saying that what he gives as Syllogism, is not properly Syllogism at all; but I will at the outset confine myself to the assertion that what he gives is the least prominent fact in the theory of the Syllogism.

The first of the two objects of the Syllogism, the one that Mill sets forth almost exclusively, is to exhibit the full form of the Deductive

process in its simplest type : 'Men are mortal, kings are men, kings are mortal'. It is an interesting and useful part of Logic to explain in what consists a scientific deduction, or inference from generals to particulars, as in the onward march of a deductive science. You must first obtain somehow a general rule or law ; you must next prove an identity between a given instance and the subject of the rule or law, and the identity being made good, you may apply the predicate of the general law to the subject of the new instance. You identify kings with the objects named men, and you pass over to kings the predicate of the law, mortality.

Now, I apprehend that this explanation, although valuable as a part of Logical Method, and undoubtedly connected with the Syllogism, is the thing that is least present to the mind of the Syllogistic logician. It belongs almost entirely to the matter of reasoning, and scarcely at all to the form. It fastens the attention upon the two circumstances, in the matter, necessary to a good deduction—the truth of the principle and the relevance of the case to be brought under it ; the one circumstance to be made good by a material induction, the second circumstance dependent on a material identification—the examination of actual kings with a view to identify them with men at large. In the engrossment of the mind with these two grave determinations, the form is left almost entirely out of sight. The case has been chosen so as to make the least possible demand upon the consideration of form. The question as to a proper formal relation between the premisses and the conclusion is rendered dormant, because the relation is so simple and obvious as not to constitute a question.

Now it is to this simple type of reasoning, in which all that is characteristic of Syllogism escapes attention, that Mill confines his view ; on it he makes out Syllogism a *petitio principii*, as commonly viewed, and indicates the solution by recalling to mind the proper meaning of a general proposition.

The second meaning of Syllogism, then, is the *formal* relation between the premisses and the conclusion, whatever the matter be. If all syllogisms, all cases of argument or inference, were of the type of Barbara, I doubt whether Syllogism would ever have been invented. Not that in Barbara there is not an element of form ; but that being so easy, we need not even be conscious of it. But the inventor of the Syllogism was awakened to the fact that in many kinds of reasoning, not unfrequent in their occurrence, the formal relation of premisses to conclusion was puzzling and uncertain, not to say misleading ; and he set his great ingenuity to work to exhaust the varieties of legitimate formal relations, to reduce them under heads, and to ascertain what characteristics of propositions they grew out of. I apprehend that the machinery of Figures and Moods, resting as it does on the Conversion of Propositions, of various quantity and quality, is the most strict and proper expression of the Syllogism. This part of reasoning is found to make a study of itself ; and its expounders are not to be held as denying the necessity of looking to the matter on the proper occasion.

On this view, the theory of the Syllogism is not the whole theory

of the proof of a conclusion from its premisses : it is the theory of one part of the proof, which in some instances is so evident as not to make a question at all, but in other instances is so embroiled with perplexity in the verbal statement, as to demand the help of a rule or formula such as is furnished by the detailed figures and moods. If logicians have been too exclusively occupied with this formal condition of sound inference, that is their infirmity. Any formalist that chooses to state his position guardedly, could, in answer to the charge of *petitio principii*, retort upon Mill the equally grave accusation of *ignoratio elenchi*.

The solution of the difficulty attending the material inference, for which Mill deserves and has received the highest praise, grows out of the sound view of general names and propositions, which any thorough-going nominalist would be likely to bring to the light. I apprehend that the place of this explanation in a logical system is antecedent to Syllogism ; it would properly fall under the Name, or at least under the Notion or Concept, and would be carried from thence to the Proposition. In laying down the characteristic of the *general* proposition, the warning should be given that the generality is to a certain extent a fiction ; the affirmer of the proposition, 'All matter gravitates,' is speaking of some things that he knows and of a great many things that he does not know : his proposition is a mixture of the actual and potential ; it affirms what is to be when the case arises ; when any new piece of matter is found, the proposition is to apply to that. A patent of peerage is given for those that are not yet born ; it is therefore, in one sense, an empty behest : there is as yet nothing corresponding to the term.

When this is seen to be the character of the general proposition, the inference from it is no longer a repetition of the major. The major is whoever shall be descended from a given person ; the minor is—a child has been born to that person ; the conclusion greets this child as the future peer. The process of investing the newly discovered individual with the attributes belonging to the previously known individuals of the same kind is something to be gone through ; it is not mere emptiness or nonentity.

A large part of Mill's chapter is occupied with illustrating Material Deduction. He described very justly what this consists in, namely, examining whether the new case possesses the marks that identify it with the rule, or with the individuals that give the meaning to the rule. Now, this I hold to be extraneous to the consideration of the Syllogism, on any admissible view of it. I maintain this on two grounds : first, it is not of the same kindred as Syllogism ; second, it is of the kindred of Induction.

If Syllogism be, to use De Morgan's expression, 'the form, the whole form, and nothing but the form,' Material Deduction can have no place in it. But the obverse position is more instructive. Is Material Deduction of the kindred of Induction ? To answer this, we have only to reflect that an induction is the material comparison of individual facts, carried on till we are satisfied that we have established

a coincidence (or non-coincidence) between property A and property B such as we can rely on in all future cases; so that whenever A turns up, we assume at once that B is (or is not) there also. Now Deduction is the ingathering of the new cases; and the logical part of the operation lies in the material inspection of each suggested case to see whether it is or is not an A—the comparison of it with the previously recognised A's. Just as Induction is a comparison of like instances, so Deduction is a comparison of like instances. The induction has arisen by finding the resemblance of A, C, D, E: the deduction finds the resemblance between X and these others; the mental exercise is therefore one and the same. It relies upon the same species of ability, it incurs common liability to mistake, and is fenced by the same safeguards. The only respect where it fails is in not looking to the *conjunction* of A and B; this, however, is merely to confine the process, without altering the character of it.

Although Deduction is thus of a kindred with Induction, it farther resembles Classification, which is also a process of the matter—a comparison of facts in their concrete character. It contains the process that Induction and Classification agree in—the making sure of a resemblance between particulars. If Induction is made to precede Classification, the process is first brought on the stage under Induction; if the order were changed, it would in substance be brought up under Classification. Still, it would re-appear under Induction; and the place for it is not difficult to assign. If we refer to Mill's chapter on the Deductive Method, we see that he brings in this method after he has finished his Experimental Methods. We see also that his idea of the Deductive Method is "to find the law of an effect from the laws of the different tendencies of which it is the joint result". This supposes that the laws of the tendencies have been previously ascertained by Induction, and are now to be extended by Deduction. The first stage of the deduction is to follow out each separate law by itself: to hunt out new applications by new identities. Great discoveries and important verifications may be effected by going in the track of a single induction, by gathering in the remote and unthought-of instances; as when Newton pushed gravitation to such recondite consequences as the precession of the equinoxes. There is thus a department of deductive inquiry and proof anterior to Mill's calculation of combined tendencies. This department has no place in Syllogism, it has no relation to any Syllogistic operation; it is the same comparison of instances as is employed in building up an induction. Whatever is proper to be said about it, whatever directions may be given for it, should be at the point where Mill's Deductive Method is launched, and just before his problem of computing combined tendencies. If nothing needs to be said about it, so much the better; but something is actually said by Mill—in the wrong place.

It was considered by many—most emphatically so by Grote—that Mill had introduced for the first time a unity into Logic, had bridged the chasm that separated the Inductive from the Syllogistic Logic. In my opinion, this cannot be done, and should not be

attempted. Real or Material Deduction should certainly be made continuous with Induction and with Classification, but Syllogism stands apart from them all; it is as far off from Deduction, in Mill's rendering, as it is from Induction. The consideration of the formal relation of the premisses to the conclusion, which the inversions of language compel us to regard as a serious study, has nothing in common with the Logic of Matter, in any one of its three divisions—Classification, Induction, Deduction. It walks by the side of these, and is no farther connected with them than as ministering to a common purpose. I could not assign any reason for the particular place or order of the Syllogism in Mill's *Logic* or in any of the systems that include Induction. It might be just as well at the end as at the beginning. Its entire absence would not be felt in any of the problems of Induction or of Classification. It gives a discipline altogether apart.

It may, therefore, in my opinion, be justly objected to Mill's chapter, first, that the ideas, which are individually sound and valuable, are taken out of their proper places, and put together in an incongruous compound; and second, that the title is a misnomer: there is nothing actually said as to the Functions and the Value of the Syllogism.

A. BAIN.

*J. S. Mill's Philosophy tested by Prof. Jevons.*—It has been understood for some time that Prof. Jevons was engaged in a critical scrutiny of Mill's philosophical writings, and recently, in the new edition of his *Principles of Science*, he announced his intention of publishing a book on the subject. The incidental criticisms on Mill that lie scattered through his previous works had hardly justified the anticipation of very important results from the more formal scrutiny when it should appear; nor was the specimen he gave of it a few weeks ago, on occasion of a controversy in the *Spectator* about Mill's doctrine of Religion, encouraging, for he then laid himself open to a very smart rebuff from his adversary. Now, in the *Contemporary Review* of December, he returns to the charge, and, after rehearsing shortly (with some difference) the *Spectator* dispute and sounding a preliminary flourish, he brings out one of his greater guns and fires it off against Mill. At the same time we are promised a whole series of papers, to follow on the present one which deals with Mill's view of the foundations of geometry. So the regular battle, or rather bombardment, must be understood as begun, and begun it certainly is with no ordinary fury. The plan of attack has its disadvantages, but at all events it leaves the assailant time for reflection after delivering his fire, and it may not be amiss that a bystander should venture to interpose with a few words at the first pause.

For about twenty years past, so we are told, Prof. Jevons has been a more or less constant student of Mill's works, and during the last fourteen years he has been compelled, by the traditional requirements of the University of London, to make them at least partially his textbooks in lecturing. Some ten years of study passed before he "began

to detect their fundamental unsoundness," and during the last ten years the conviction has gradually grown upon his mind that "Mill's authority is doing immense injury to the cause of philosophy and good intellectual training in England". Able writers have fired this shot or that into "the sand of his foundations," but "the assault must be made directly against the citadel of his logical reputation". "For my part," exclaims Prof. Jevons, "I will no longer consent to live silently under the incubus of bad logic and bad philosophy which Mill's works have laid upon us". "The disconnected and worthless character of his philosophy" shall at length be exposed. As for his logic—his logic indeed! "There is nothing in logic which he has not touched, and he has touched nothing without confounding it."

It is all very curious: curious that it should have taken ten years to discover Mill's defects; curious that in ten years more it should not have been discovered that all of them that are real have been well-known to philosophical inquirers for a long time past, and that the world has by no means stood still the while. Is it not the fact that those who think most highly of Mill are some of those who differ most gravely from him? They think of him as one who gave an unsurpassed expression—an expression that will *now* probably never be surpassed—to the philosophy of individual experience, but they have left this behind. They are perfectly familiar with all the inconsistencies that Prof. Jevons would now laboriously bring to light; and yet they can honour the man who, from the point of view that satisfied all the masters of English thought before him, first set himself in a serious spirit, since the sciences have grown, to devise a comprehensive theory of scientific knowledge. His friend, Prof. Bain, who stands perhaps nearest to him in point of logical theory, is far from agreeing with him altogether, (as this very number of *MIND* bears fresh witness), and never was beholden to him in psychology: rather it was Mill that here professed himself the learner to the last. Mr. Spencer and Mr. Lewes—to say nothing of younger men—have gone ways of their own that are very different from Mill's, and which he was little disposed to follow. Many will acknowledge that they have learned from him, but is it possible to name one thinker or teacher of any standing who is prepared to subscribe himself Mill's disciple? For whose benefit, then, one wonders, is this series of papers to be written?

No doubt, his books are much in the hands of students; but there is a good reason for that. Since Mill's *System of Logic* appeared, has there been any other work half so well fitted to stimulate thought on the subject? Prof. Jevons appears, by his way of printing the word, to have some special contempt for Mill's assumption of having produced a "system". If this is what he means, surely never was contempt so little in place. Mill's book is a model of orderly methodical exposition, and, though never specially intended for academic use, fairly conquered the attention of teachers and students. It must have been because of its inherent merits, for no writer could have started from a more unfavourable position than Mill or cared less, in edition after edition of his work, to make it accessible to the mul-



titude. Accordingly, it is open to any one at any time to oust the book from its academic standing. One has only to write a "system" as carefully articulated as Mill's, as clearly grounded in its philosophical basis, and, if it reflects the present enlarged conceptions of Experience as faithfully as Mill's philosophy embodied those of a past time, no fear but the writer will quickly deliver the Universities from their "incubus"—particularly if he has an intimate knowledge (Mill had none) of students' needs. For the present, if it be the fact—as Prof. Jevons has somehow convinced himself though he must be singular in his belief—that the voice of Mill alone is heard in the schools, let us be thankful that it is no worse than it is. We may remember, too, that it is the way of academic instruction to lag somewhat behind the pace of advancing inquiry.

At this time of day there is no need to spend many words on the objections brought by Prof. Jevons against Mill's view of geometrical science. The case is very cleverly put and will duly impress the imagination of all those who can believe with himself that the like was never heard before; but everything in his argument that has any force has been urged by others over and over again, and what is new is not very happily urged. His great point is to show that Mill, after asserting that perfectly straight lines do not really exist, ends by implying and even asserting that they do exist, because the imaginary lines with which the geometer is said to work (or "experiment") are declared to "exactly resemble real ones". But here he misconceives Mill's plain meaning to begin with, and before he reaches his conclusion he has to interpolate a premiss for which Mill is not in the least responsible. In denying (with whatever reason) that straight lines really exist, Mill never says that we have no perception of lines as apparently straight. So, when he comes to deal with the imaginary lines by which he supposes the geometer able to increase his experience indefinitely, he may very well say that these exactly resemble the lines that are perceptibly (without being really) straight. The premiss interpolated by Prof. Jevons, in order to convict Mill of self-contradiction, is the assertion that "if these imaginary lines are not perfectly straight they will not enable us to prove the truths of geometry"; but of course Mill would allow nothing of the sort. Did he not from the first declare, with Dugald Stewart, that there is a purely hypothetical element in the definition of geometrical figures, and that it is this, and not anything we can actually see or imagine, that enables us to prove the truths of geometry? (See moreover a note added to his old statements in the latest edition of the *Logic*, p. 261.) However it is no affair of mine to defend Mill's positions. I, for one, cannot think of basing the knowledge of geometrical principles on individual experience, least of all on that kind of passive experience, received by way of the senses, which Mill, without making proper use of the psychology he accepted, generally was content to assume. That all his ingenuity should fail to prove his case, and that, in his anxiety to solve so great a difficulty, his very ingenuity should land him in such really discrepant assertions as Lange, for example (*Gesch. des Mate-*

rialismus, Vol. II, p. 18), points out, is only natural. I will add but one other remark on Prof. Jevons's polemic, namely, that he seems to me particularly unfortunate in singling out for especial rebuke that which Mill calls "geometrical experimentation" with imaginary lines. Mill there had come imperfectly (as I have elsewhere tried to show, art. "Axiom," *Encycl. Brit.*, ed. 9th) upon an equivalent for that work of the "productive imagination" which plays so important a part in Kant's classical explanation of geometrical synthesis. He had come upon it imperfectly because he did not ground this process of free "experimentation," as he might have done, in the psychological fact that we apprehend extension through muscular activity that we consciously put forth, and not through any sensations passively received. But his recognising the process at all was a proof of no ordinary insight; and if Professor Jevons would only think of it as something not quite absurd, he might arrive at some rational explanation of the difference that he always notes in his own works, but never in the least accounts for, between geometrical and physical induction.

And this last observation suggests the one other word I will take the liberty of addressing to my friend Prof. Jevons on the present occasion. It will doubtless occur to many readers that Mill's vehement critic comes upon him after all only in the guise of Nemesis for his own treatment of Hamilton. Neither am I one of those who rate the *Examination of Hamilton* most highly. But if to some extent Mill did then no better than Prof. Jevons is now doing, in one respect he did in that book very well. In the midst of all his criticisms on Hamilton, he offered some very notable independent contributions to philosophical theory; and but for the *Examination* we should not know Mill's mind on many of the most pressing questions of philosophy. Whole chapters and many parts of chapters are constructive. Now may one hope that Prof. Jevons will not fall below this example? He is very indignant over Mill's "false empirical philosophy," but guards himself against being supposed to deny the experiential foundation of all knowledge; and the *caveat* is very much in point from one who can write about the senses and what we get from them in the *naïf* way of the author of *The Principles of Science*. Will he then, for once in a way, tell us quite plainly what he considers are all the elements of a *true* empirical philosophy? If he does, he will supply a much-needed foundation for his logical theories, and, though the work would be done better without the accompaniment of a war-dance over the prostrate form of Mill, he has a right, if he pleases, to that kind of amusement. If he does not, his exhibition may win him a great deal of applause from the prejudiced and the unthinking, supposing always that he manages to remain to the end as piquant as in the first act; but at the end, Mill will be found to hold just the place that he holds now in the estimation of all serious thinkers who know what is and what is not. Will Prof. Jevons retain *his* place?

EDITOR.

## IX.—NEW BOOKS.

*Lessing: his Life and Writings.* By JAMES SIME. 2 vols. London: Trübner & Co., 1877. Pp. 327, 358.

LESSING is a name which, in addition to its charm for lovers of literature in general, has special attractions for the student of philosophy, and English readers are to be congratulated on the almost simultaneous appearance, though at this late hour, of two accounts of the man and his work—Miss Zimmern's, which for some time has been announced, and Mr. Sime's. Mr. Sime's volumes embody the results of careful scholarship and independent reflection. He renders, on the whole, ample justice to the philosophical side of his subject. Chapter xxix., which treats of Lessing's philosophy, with which chapter xxvii., containing an account of *The Education of the Human Race*, should be taken, defines Lessing's position in relation to the leading philosophic questions of his day. Lessing was one of the first to formulate that idea of progress which was one of the most valuable products of eighteenth century thought, although Mr. Sime appears to go too far when he says that "in *The Education of the Human Race*, the idea of progress was first formally stated," and that it became the possession of cultivated Europe, through Lessing and Herder. It is probable that Priestley—who wrote before Lessing and who stimulated Condorcet—did as much at least as Lessing to give shape and stability to the new doctrine. In the more abstract department of philosophy, Lessing's services consist mainly in the exposition and popularisation of Spinoza, a thinker whose claims up to that time had been grossly neglected. Lessing had found his way to Spinoza out of the intricacies of the dominant Leibnitzo-Wolfian philosophy, and the little he has left us in writing and recorded conversation illustrates, as Mr Sime very clearly points out, the condition of mind of one who was a careful and thoughtful learner from both Spinoza and Leibnitz, a learner who drew now from the one, now from the other, without seeking to reduce the ideas thus acquired to a harmonious and systematic shape. Of Lessing's work in *Æsthetics*, which is, perhaps, after all his most valuable bequest to students of philosophy, Mr Sime gives us a full and appreciative account. The method followed in the *Laokoon*, and in the *Hamburg Dramaturgy*, was nothing less than a fruitful discovery in the science of criticism, as the permanent results attained amply testify. No doubt Lessing's field of observation was limited, and in the case of dramatic theory he was (as the present writer has elsewhere maintained) unduly influenced by classic authority. Yet, though some of his conclusions may at first appear narrow and arbitrary to us, this generally arises from the fact that he is not concerned to limit and qualify the principles he reaches. All art is a compromise between many principles or ends, and this Lessing knew well enough, though he had no special occasion to enforce the

truth. This fact, however, does not preclude the possibility of reaching conditions which on the whole, and when there is no special reason to override them, mark off certain forms of art from others. We could wish that Mr. Sime had criticised both the *Lao-koon* and the *Dramaturgy* with a fuller recognition of the essential character of art principles. Had he done so, he would not so lightly have rejected some of Lessing's conclusions respecting the visual arts as wholly arbitrary, merely because he was able to find a number of exceptions to Lessing's rule even among works admitted to be excellent. Thus, for instance, it may be, on the whole, undesirable to present the fugitive and evanescent in permanent pictorial representation, even though Mr Poynter, for the sake of a rich and striking effect, chooses to represent Atalanta in the act of stooping to pick up the golden apple as she runs. On the whole, however, Mr. Sime's remarks on Lessing's theory of art are just and discriminating. [J. S.]

*New and Old Methods of Ethics, or "Physical Ethics" and "Methods of Ethics".* By F. Y. EDGEWORTH, M.A. Oxford and London: Parker & Co., 1877. Pp. 92.

THIS is an attempt to mediate between the conceptions of a Physical and an Introspective Ethics as represented by Mr. A. Barratt and Mr. H. Sidgwick, and also to develop these conceptions more fully than has yet been done. Section I. takes up the principal points at issue between these two writers. Intuitivism as defined and justified by Mr. Sidgwick is defended as against the Egoistic Hedonism of Mr. Barratt. At the same time the possibility of placing an adequate ethical doctrine on a physical basis is fully maintained. The conditions necessary to this perfection of ethical science are said to be: (1) That all non-hedonistic action (if such there be) is of the nature of personal or ancestral habit; (2) that the physical conditions of the genus non-hedonistic action and the species sympathy are discoverable; (3) that the physical conditions of this perception of rightness (sentiment of duty, &c.) are discoverable. The writer seeks to obviate the objection of J. S. Mill (repeated by Mr. Sidgwick) that the imperatives of Ethical Science cannot be deduced from propositions relating to matters of fact. Under Section II. various points raised in the *Methods of Ethics* are more directly dealt with. By far the largest part of this section is taken up with an elaborate attempt to "extricate a clear, and, as it may be termed, a mathematical conception of exact Utilitarianism". Setting out from Bentham's formula "the greatest happiness of the greatest number" (which though unsatisfactory is said to contain implicitly the idea of an exact Utilitarianism) and fully equipped with the latest conceptions of psychophysics as defined by Fechner, Wundt, &c., and with those formulæ of the calculus of variations which are applicable to the problem, the writer reaches a number of conclusions respecting the best possible (that is the most felicitic) distribution of the external means of happiness. These results "neither unexpected nor yet

distinctly foreseen by common sense" may be gathered up as follows: (1) In the case of races or societies so nearly related in the order of evolution as the Aryan, equality of distribution is the law; only when there is a great interval (as between highly civilised races and savages) is the superior class to be privileged. (2) Population ought to be limited. (3) As to the quality of the sentiments or recipients, this should be as high as possible, as measured by the scale of Evolution (which tends to increase indefinitely the capacity for happiness); but if number and quality should ultimately come into competition, the indefinite improvement of quality is no longer to be wished. That is to say, if in a stationary state of industry an increase of culture, owing to its material cost, is only possible by means of a diminution of population, it should not be aimed at. "Not the most cultivated coterie, not the most numerous proletariat, but a happy middle class shall inherit the earth." The pamphlet contains a large number of suggestive criticisms on other recent ethical writers besides the two put prominently forward.

*The Methods of Ethics.* By HENRY SIDGWICK, M.A., Prælector in Moral and Political Philosophy in Trinity College, Cambridge. Second edition. London: Macmillan, 1877. Pp. 469.

THE alterations and additions in the second edition of Mr. Sidgwick's *Methods of Ethics* are so extensive that the Supplement (issued in a separate form, for the convenience of possessors of the first edition) runs to over 120 pages: there is, however, no important change of view on any essential point, and the additions being mostly substitutions, the volume is not increased in size. Nearly half of the new matter belongs to Book I. The introductory chapter has been nearly rewritten, and § 1 of ch. ii. entirely; the latter now containing a much more luminous discussion of the relation of Ethics to Politics both from the Utilitarian and Intuitionist points of view. Ch. iii. again, on "Reason and Feeling," is almost all new, and gives a more thorough and distinct account of the author's theory of Reason as a moral faculty, which is the key of his position. Perhaps the most serious change of opinion which the new edition shows is contained in ch. iv. on "Pleasure and Desire" (§ 1). Mr. Sidgwick formerly maintained that the psychological doctrine that volitions are always determined by the greatest pleasure (or relief from pain) in prospect is incompatible with any Method of Ethics except Egoistic Hedonism. But this he has seen fit to retract, on reflecting that to conscientious persons the pleasurable of conduct is more or less dependent on its rightness. Ch. v., on "Free Will," in spite of some difference in the exposition, is not materially altered. Towards the end of ch. vi. § 2, a short paragraph on the evolutionary interpretation of "Conformity to Nature" deprecates any hasty assumption that we may identify "what ought to be" with "what certainly will be". Amidst the new matter in ch. vii. occurs the significant remark that "the notion of self-realisation is to be avoided in a treatise on Ethical method, on account of its in-

definiteness". The chief additions in Book II., chs. ii. and iii., are foot-notes in answer to objections urged by Mr. Green. A clearer account of the notions of Motive and Intention has been inserted in Book III., ch. i. In ch. ii., § 2, an alteration appears in the definition of Virtue. In ch. xiii., there are extensive modifications: the intuitive principle, that it makes no difference to the general sum of good to what subject any part of it belongs, is perhaps less distinctly expressed (§ 3); and the misunderstood passage (§ 5) concerning the "suppression of Egoism" has itself been suppressed. Readers of *MIND* will recognise in ch. xiv. some ideas which were published in No. V., in an article by the author on "Hedonism and Ultimate Good". Interest in the alterations in Book IV. will probably centre in the last chapter: it has been re-cast, but the doctrine of the "Dualism of Practical Reason" remains.

*The Principles of Science: a Treatise on Logic and Scientific Method.*  
By W. STANLEY JEVONS, LL.D., &c. Second edition, revised.  
London and New York: Macmillan & Co., 1877. Pp. 786.

THIS second and cheaper edition has been revised throughout and appears with a great number of verbal and other changes, but none of them radical. In a new preface (pp. xxvi.), the author gives a number of interesting historical references, and replies to some of the critics of his first edition. It appears that the well-known (third) Lord Stanhope long ago busied himself, among his other inventions, with a mechanical device for the representation of logical inferences, and, his Demonstrator (as he called it) having lately been placed with his papers in the hands of the Rev. R. Harley, F.R.S., some account of it may shortly be expected. The other historical matter of chief importance into which Prof. Jevons enters is Leibnitz's anticipation of the Principle of Substitution, to which his attention has been called by Prof. Adamson. He replies to his critics (among others his critic in *MIND*, No. II.), in a very candid spirit, though he shoots rather wide of some of the objections urged against him. One or two of the corrections suggested in this journal he has accepted. It is a pity, when he was about it, that he did not accept some others. We are still, for example, told, at p. 63, that a valid conclusion may be obtained from two negative premisses, when it is plain that either there are four terms, or if three terms then only one negative premiss. Also, at p. 58, where he gets the conclusion  $A = B$  from the two premisses  $A = AB$ ,  $B = BA$ , he still goes on to say, with a singular inversion of the plain meaning of words, followed at once by an absolute refutation of himself, that "the conclusion is more simple and general than either of the premisses, and contains as much information as both of them put together". How can a compound be "more simple" than its elements? How can a special relation that holds only under two relations taken together be "more general" than either of them? Or how can that which "is more simple and general than either of the premisses" contain "as much information as both of them put together"? This, of course, is but a sample of

what must happen, if one will start, in Logic, from  $A = B$  as a "Simple Identity". A simple *identity* it may be, but Prof. Jevons himself here proves it to be anything but a simple *proposition*. No doubt, however, a change at this point would have been very radical.

*Life and Habit.* By SAMUEL BUTLER. London: Trübner, 1878. Pp. 307.

AN attempt by the author of *Erewhon* to consider, in a popular way, whether the unconsciousness, or quasi-unconsciousness, with which we perform certain acquired actions, throws light on embryology and inherited instincts, also upon the question of the origin of species and the continuation of life by successive generations. The phenomena of heredity he finds to be so like those of memory, and to be so utterly inexplicable on any other supposition, that it is "easier to suppose them due to memory in spite of the fact that we cannot remember having recollected, than to believe that because we cannot so remember therefore the phenomena cannot be due to memory". Our inherited experience was gained by us when we were in the persons of our forefathers. The accumulation of variations which in time amounted to specific and generic differences of living things, was due to intelligence and memory in the creature varying, rather than to natural selection. "Life is that property of matter whereby it can remember. Matter which can remember is living; matter which cannot remember is dead."

*Diseases of the Nervous System: their Prevalence and Pathology.* By JULIUS ALTHAUS, M.D., &c. London: Smith, Elder & Co., 1877. Pp. 366.

THE author has "endeavoured to elucidate the part played by diseases of the Nervous System in national pathology, and to show the laws to which their occurrence and fatality are subject". He has also "fully entered into the special pathology of the several diseases of the nervous centres". "The pathology of peripheral nerve-diseases, and the diagnosis, prognosis, and treatment of the entire class of these maladies will be considered in a subsequent volume."

*What is Play? Its bearing upon Education and Training.* A Physiological Inquiry by JOHN STRACHAN, M.D. Edinburgh: Douglas, 1877. Pp. 108.

A VERY interesting and, in the main, a wise little book. Taking Play to mean all "active exercise in the young, prompted by natural inclination and producing pleasure," the author first shows its importance for bodily "development," as opposed to mere "growth" (such as goes on without development in a bedridden child). He then passes to Play as an exercise of the Mind, and comes to the conclusion "that exceptional mental development is always preceded, and is indeed produced, by an exceptional amount of exercise in play of the special faculties concerned". Play is, in fact, found to be in all



cases a preparation for Work, differing from work only in its motive and object; and the different play-instincts both of the sexes and of individuals should be regarded by the educator as indications of the right courses to follow in express training.

*Theism*: being the Baird Lecture for 1876. By ROBERT FLINT, D.D., LL.D., Professor of Divinity in the University of Edinburgh, author of *The Philosophy of History in Europe*. Edinburgh & London: Blackwood, 1877. Pp. 432.

"The lectures in this volume have been delivered in Glasgow, St. Andrews and Edinburgh, in connection with the lectureship founded by the late Mr. James Baird of Auchmedden and Cambusdoon. They will be followed by a volume on Antitheistic Theories, containing the Baird Lectures for 1877."

"Contents: (1) Issues involved in the question to be discussed—Whence and how we get the idea of God. (2) General idea of Religion—Comparison of Polytheism and Pantheism with Theism—The three great Theistic Religions—No religious progress beyond Theism. (3) The nature, condition and limits of theistic proof. (4) Nature is but the name for an effect whose cause is God. (5) The argument from Order. (6) Objections to the argument from Order examined. (7) Moral argument—Testimony of Conscience and History. (8) Considerations of objections to the Divine Wisdom, Benevolence and Justice. (9) *A priori* theistic proof. (10) Mere Theism insufficient."

In an appendix (pp. 323-425) the author has a number of notes, chiefly controversial, on different philosophical aspects of the question.

*The Causational and Free Will Theories of Volition*: being a review of Dr. Carpenter's *Mental Physiology*. By MALCOLM GUTHRIE. London: Williams & Norgate, 1877. Pp. 106.

The author supplies the following statement:—

"Part I. is an exposition of the Causational Theory, followed by a reply to the objections brought against it by Dr. Carpenter, namely: (1) That it involves Materialism. (2) That it makes man an automaton: the employment of which term in modern discussions is condemned, while in practical use it is shown to be identical with either 'causation' or 'involuntary'. (3) That Choice is incompatible with Causation; the reply being that choice is the exercise of Practical Reason, which is defined. (4) That Effort is incompatible with Causation; the reply being the suggestion of a motive having for its object the effectuation of Volitions. (5) That on the Causational Theory there can be no blameability or responsibility.

"Part II. is a statement of the Free Will Theory, with an examination of the terms employed. Then follows a criticism of the Self-Determining Power to ascertain where the breach of continuity of sequence occurs, showing that the said power must eventually be regarded as a faculty having its due place amongst others. The concluding section shows by means of extracts from Dr. Carpenter's work, that, whatever it is, it is subject to laws of Heredity, Education, Adaptation, &c., the same as every other human activity.

"An appendix contains a criticism of Mr. Bradley's *Ethical Studies*, Essay I."

*Die geschichtliche Entwicklung des Farbensinnes.* Von Dr. Hugo MAGNUS, Privatdocent an der Univ. Breslau. Leipzig: Veit, 1877. Pp. 56.

*Die Entwicklung des Farbensinnes.* Von Dr. H. MAGNUS, &c. Jena: Dufft, 1877. Pp. 22.

WORKING on the basis of historical research laid down by Geiger (*Zur Entwicklungsgeschichte der Menschheit*), Gladstone (*Homeric Studies*) and others, Dr. Magnus, in these two tracts, reaches the following conclusions:—(1) In the earliest stage of the development of the colour-sense, red was the only colour recognised as such, while even this was not clearly distinguished from brightness or mere light; at this stage the single function of the retina was sensibility to different quantities of light. (2) In the succeeding stage, the sense of colour was more sharply differentiated from that of light, red and yellow now being discriminated from mere brightness. (3) In the next stage, the light and dark shades of green became distinguished as independent colours, the first from pale yellow and the second from darkness in general. (4) Finally, in our own stage, blue and violet are recognised as colours, though these are not yet perfectly separated except by the more cultivated eyes. That is to say, the course of development of the sense of colour has corresponded with the prismatic order, beginning with the colours (reds) most rich in light and gradually arriving at those (violets) of feeblest light-intensity. These facts are thus conceived by the author. The sensibility to colour is a higher function of the retina, which appears only when its irritability or excitability has been increased and made more delicate through the incessant action of the light-stimulus. "As an immediate consequence of this intensified and refined activity, the retina acquired the capability of distinguishing the colour of the impinging rays as well as their light-intensity." Dr. Magnus illustrates the relation here assumed between the sense of colour and the condition of excitability produced through light-intensity, by a reference to the familiar fact that even to our developed organ coloured light loses its colour when (as reflected by objects in evening dusk) it falls below a certain intensity or degree of luminosity. The author conceives that the peripheral regions of the developed retina which are very inferior in the discriminative sense of colour represent a past stage of development of the eye as a whole. Wisely perhaps, he does not seek to bring his results into connection with either of the two principal theories respecting the physiological conditions of sensations of colour which are at present in vogue in Germany. It might be found that they are capable of being more fully interpreted either by the hypothesis of Young and Helmholtz—that different colours involve different nerve-elements, or by the theory of Wundt—that all differences of colour-impression depend on the form of excitation of the same elements. Dr. Magnus cannot be said to supply an adequate physiological interpretation of his facts, though he has certainly rendered good service in preparing the way for such an interpretation.

[J. S.]

*Gedanken über die Socialwissenschaft der Zukunft.* Von PAUL v. LILIENTHAL. 3 Bde. Mitau: Behre, 1873-7. Pp. 399, 455, 484.

THESE volumes start with the conception of Society as a real organism, and attempt to work out this point of view upon the methods proper to the Natural Sciences. The treatise commences with a demonstration that Society consists of individuals in the same manner as the physical organism is made up of cells, and that the one is real in the same sense as the other. With this idea the author seeks to exhibit a thorough-going identity between the laws of Nature as they exist in the case of its highest development, Society, and in its lower stages, including the individual human being. The first volume is entitled "Human Society as Real Organism;" the second, "The Laws of Society;" the third, "Social Psychophysics;" and a fourth is promised upon "Social Physiology". The first three parts are worked out with great minuteness, the connecting thread being the conception of a real analogy between the individual and the social group as the essential foundation of the Social Science of the future.

*Das Problem einer Naturgeschichte des Weibes.* Historisch und kritisch dargestellt von FRIEDRICH VON BAERENBACH. Jena: Dufft, 1877. Pp. 126.

NOT intended as a *solution* of the problem of a Natural History of Woman—for which the author invokes the exertions of an inquirer like Mr. Darwin—but as a statement of what it must involve as the preliminary step towards determining her true social position. The author got his impulse from Schopenhauer and Michelet, who, in spite of their differences, seemed to him to work in the same scientific direction. Among English writers, he is most beholden to Prof. Huxley.

*Vorträge und Abhandlungen.* Von EDUARD ZELLER. 2te Sammlung. Leipzig: Fues's Verlag (R. Reisland), 1877. Pp. 550.

IN this second series of collected essays (sixteen in number) by Prof. Zeller, rather more than half are on philosophical subjects. The last four are academic addresses that excited much attention at the time of their delivery, and it is well they are now reproduced in a form that will henceforth make them accessible for reference: "On the problem of Philosophy and its relation to the other Sciences" (1868); "On the present position and task of German Philosophy" (1872); "On the meaning and problem of Theory of Knowledge" (1862) with "Additions" (1877); "On the Teleological and the Mechanical explanations of Nature as applied to the Universe" (1876). The series opens with a long discussion "On the origin and essence of Religion" (1877), followed by a paper on "Religion and Philosophy among the Romans" (1865). The subject of another essay is "Lessing as a Theologian" (1870).

*Kant's Begründung der Ethik.* Von Dr. HERMANN COHEN, ord. Prof. der Phil. an der Universität zu Marburg. Berlin: Dümmler, 1877. Pp. 328.

THE acknowledged leader of the Neo-Kantian movement in Germany here follows up his classical interpretation of Kant's Theory of Experience with an exposition of the fundamental principles of the Kantian Ethics. Prof. Wundt's general sketch of the movement in the last number of *MIND* may, it is hoped, be supplemented before long in these pages by a fuller appreciation of the later Kantian literature, and then will be the time to do justice to Prof. Cohen's varied activity. The preface of his new work contains a short but very striking defence of his philosophical position. Rejecting the imputation of aiming at a mere "Kant-philology," he does not hesitate to declare that Kant's "Transcendental Method" must henceforth rank as of no less account for Science in general than the fundamental logical principles themselves; and that the advancing philosopher of the present day has a duty in relation to Kant like that of Newton's successors in physics to the author of the *Principia*. "Kantian philosophy is nothing else than philosophy as science," and the essence of science is to be steadily progressive from positions already won. As regards the special subject of his present work, the author holds it to be no accidental sign of the truth of the Critical Method that it bases the possibility of an Ethics in the Doctrine of Experience. To exhibit Kant's foundation of Ethics is to show Ethics based in the Theory of Knowledge.

*Die Vorsokratische Philosophie der Griechen in ihrer organischen Gliederung.* Dargestellt von S. A. BYK. Zweiter Theil: "Die Monisten". Leipzig: Schäfer, 1877. Pp. 240.

THE author's first part appeared in 1876 and treated of "The Dualists," meaning those Pre-Socratic thinkers who assumed "a material foundation of all things, and by the side of this a principle of motion standing in no logical connection with it." By "Monists" he means those who assumed "either *one* absolute principle only, or, if a motor principle besides the absolute foundation, then one implicated in the very conception of it". As such "Monists," the author passes successively in review (1) The Eleatics, (2) Heraclitus, (3) Leucippus, and Democritus, (4) The Sophists.

#### X.—NEWS.

Mr. Douglas Alexander Spalding, well-known of late years for his observations on the first movements of young animals, died on October 31, at Dunkirk, on his way to the Mediterranean coast, where he was to spend the winter for the sake of his health. He had long suffered from pulmonary disease, before he was thus cut off at the age of 37.

His first observations were brought before the British Association in 1872, and afterwards worked up into an article on 'Instinct' in *Macmillan's Magazine* of Feb. 1873. Some farther observations, communicated to the British Association in 1875, were published in *Nature*, vol. viii., p. 289. All of them were very carefully made, and they may be held to have finally established what had often been asserted before but as often doubted or denied—the power of certain lower animals, especially birds, to perform extremely complex movements of an appropriate character on the first suggestion by way of the senses. It was when Mr. Spalding went on to theorise upon his observations that he became a less satisfactory guide. His facts did not, as he supposed, in the least touch the Berkeleyan theory of vision, regarded (as it should be) as an explanation of certain facts of conscious perception in human beings. And when he rode off upon his summary conclusion that "animals and men are conscious automata," he became a warning example of a certain tendency to premature and hasty speculation adverted to in some earlier pages of the present number. He not only fancied that nobody had ever dreamt of such an idea before, when in fact the whole Cartesian and even the Leibnitzian school had asserted (upon grounds of their own) a thoroughgoing parallelism with no cross-action of the physical and mental in man; and he not only went the length of doubting whether there were five people alive who were able to understand the conception. What was far more serious—he himself seemed to become incapable of taking an interest in anything else, and spent in an iteration of generalities (in critical notices of books for *Nature*) powers which, even in the short time allotted to him, might have solved several other questions of biological fact as satisfactorily as the first he attempted. Mr. Spalding who, though born in London, belonged to Aberdeenshire and spent his early years in Aberdeen, began life under great material disadvantages, and raised himself through his own exertions.

The remarkable paper by Dr. G. M. Beard on 'Trance,' reported upon in *MIND*, No. VIII., p. 568, has now been published in a separate form (Pp. 47, New York: Putnam's Sons) under the title *The Scientific Basis of Delusions*. It is "designed as an introduction to a work on the Philosophy of Delusions, which will aim to unfold in detail the phenomena of the Involuntary Life, including Trance, and to give practical suggestions for the reconstruction of the principles of evidence in their application to history and to logic, to science and to law".

A Chair of Logic and Moral Philosophy has at last been instituted in King's College, London; and the Rev. H. W. Watkins M.A., Chaplain and Censor of the College, has been chosen to fill it.

The Whyte Professorship of Moral Philosophy in the University of Oxford being vacant, through the clerical preferment of the late incumbent, Rev. J. R. T. Eaton (appointed in 1874), Mr. T. H. Green, of Balliol College, editor of Hume's philosophical works, has just been elected in his place.

The Chair of Moral Philosophy in Trinity College, Dublin, is vacant through the retirement of the Rev. Dr. McIvor, who has served the statutory period of five years for which it can (with re-elegibility) be held.

Mr. Malcolm Guthrie (31 Stanley Road, Bootle) sends the following "suggestion" :—

"In Liverpool we have formed a small society of six or ten members called the 'Philosophy Reading Club'. Our plan is to take some work of philosophical importance and, after reading a chapter at home, to examine and discuss it at our weekly meetings. The advantages of this systematic and combined study over individual desultory studies are obvious. I have no doubt you would be willing to put your readers in different localities into communication with each other for that or similar purposes."

JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. XI, No. 3. Schelling—'The Method of University Study' (Lect. 4th, trans.). Von Hartmann—'On the True and False in Darwinism' (Sections trans.). Herbert—'Application of Mathematics in Psychology' (trans.). W. T. Harris—'Michael Angelo's Fates'. G. S. Morris—'The Life and Teachings of Spinoza'. D. W. Phipps—'Kant's Transcendental Æsthetic'. Kant—'Anthropology' (trans. continued). Notes and Discussions, &c.

REVUE PHILOSOPHIQUE.—2me Année, No. X. H. Lotze—'Sur la Formation de la Notion d'Espace'. M. Straszewski—'La Psychologie est-elle une Science'? D. Nolen—'L'Idéalisme de Lange'. Notes et Documents—'Cause et Volonté,' par Alexander Main. 'Malebranche, d'après des manuscrits inédits,' par C. Henry. Analyses et comptes rendus. Rev. des Périodiques. No. XI. Dr. Ch. Richet—'La Douleur: Étude de Psychologie Physiologique'. G. Séailles—'L'Esthétique de Hartmann' (I). Notes et Documents—'Sur l'Étude du Caractère,' par le Dr. G. de Bon. Variétés—'P. Pomponazzo et ses récents interprètes italiens,' par L. Mabilleau. Analyses et comptes-rendus. Rev. des Périodiques. No. XII. Séailles—'L'Esthétique de Hartmann' (II). D. Nolen—'Le Mécanisme de Lange'. P. Regnaud—'Études de Philosophie Indienne: L'Ecole Vedanta'. P. Béraud—'Le Moi comme Principe de la Philosophie'. Notes et Documents—'Le Sens Commun: Essai d'explication physiologique,' par F. Paulhan. Analyses et comptes-rendus. Rev. des Périodiques.

LA CRITIQUE PHILOSOPHIQUE.—Vime Année, Nos. 33-47. C. Renouvier—'Le Cours de Philosophie positive est-il encore au courant de la Science?' (33, 34); 'Le positivisme jugé par M. Huxley—Les sciences naturelles et les problèmes qu'elles font surgir' (36); 'Descartes fondateur de la physique, d'après Huxley' (40); 'La question de la mort traitée scientifiquement' (41, 42, 47); 'Examen des Principes de Psychologie de Herbert Spencer: Principes de la logique' (38), 'L'emploi des expressions mathématiques' (42), 'La Perception—L'origine des connaissances' (45); 'Les labyrinthes de la métaphysique: L'infini et le continu—Une évolution personnelle' (44, 46). F. Pilon—'Monadisme et matérialisme' (38); 'La doctrine de Schopenhauer sur le libre arbitre: La conscience de la liberté' (39); 'De quelques objections au langage psychologique de Hume' (40); 'La classification des éléments de la connaissance selon Hume' (46, 47).

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XVI. Disp. 2. L. Ferri—'L'io e la coscienza di sè'. T. Mamiani—'Della psicologia di Kant' (III. e ultimo). V.—'L'idea panteistica nell'età moderna'. T. Mamiani—'Ancora dei nuovi peripatetici secondo la *Civiltà Cattolica*'. F. Acri—'Assioo ovvero della morte, dialogo di Eschine'. N. N.—'Appunti sul Darwinismo'. Bibliografia, &c.

ZEITSCHRIFT FÜR PHILOSOPHIE, &c.—Bd. LXXI. Heft 2. T. v. Varnbüler—'Das reine Seyn: Organische Synthese oder Schema?'. H. Ulrici—'Der Begriff der Entwicklung als philosophisches Princip'. E. Dreher—'Zum Verständniß der Sinneswahrnehmungen' (I.). P. Schröder—'Das Verhältniß der Causalität zur objectiven Welt'. Recensionen. Bibliographie.

ZEITSCHRIFT FÜR VÖLKERPSYCHOLOGIE U. SPRACHWISSENSCHAFT.—Bd. X. Heft. 2. H. Siebeck—'Die ästhetische Illusion und ihre psychologische Begründung. (Auf Anlass von: Volkelt, *Der Symbolbegriff in der neuesten Aesthetik*.) J. B. Meyer—'Das Wesen der Einbildungskraft: eine psychologische Betrachtung'. W. Dilthey—'Ueber die Einbildungskraft der Dichter. (Mit Rücksicht auf Hermann Grimm, Goethe.)' Beurtheilungen.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—II. Heft 1. H. Siebeck—'Die metaphysischen Systeme in ihrem gemeinsamen Verhältnisse zur Erfahrung' (I). A. Schäffle—'Ueber Recht und Sitte vom Standpunkt der sociologischen Erweiterung der Zuchtwahltheorie'. Schmitz-Dumont—'Deduction des dreidimensionalen Raumes'. B. Erdmann—'Die Gliederung der Wissenschaften'. C. Göring—'Ueber den Begriff der Erfahrung' (Schluss). K. Lasswitz—'Zur Verständigung über den Gebrauch des Unendlichkeitsbegriffs'. Recensionen. Selbstanzeigen. Philosophische Zeitschriften. Bibliographische Mittheilungen.

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*Corrections.*—Prof. Wundt wishes to have it mentioned that in his article on 'Philosophy in Germany' in MIND, No. VIII. p. 515, he erroneously ascribed to Prof. J. B. Meyer the discovery that it was the Wolffian Tetens from whom Kant borrowed his classification of the mental faculties. The discovery was made by Prof. J. E. Erdmann; see his *Grundriss der Gesch. der Philosophie*, §§ 292, 7; 301, 2. Prof. Meyer, in referring to Tetens, supposes that Kant may also have reached the same result independently.

In No. VIII., p. 576, l. 9, for *forms* read *focus*; p. 577, l. 35, for *affected* read *effected*.